W. E. ANDERSON.

MACHINE FOR TURNING CRANK PINS.

APPLICATION FILED JULY 11, 1907.

916,646.

Patented Mar. 30, 1909.

2 SHEETS—SHEET 1.

Fig. 3.

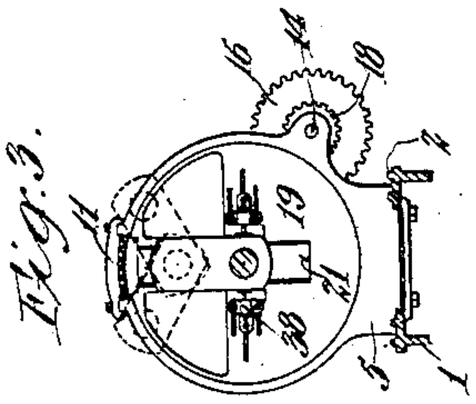


Fig. 1.

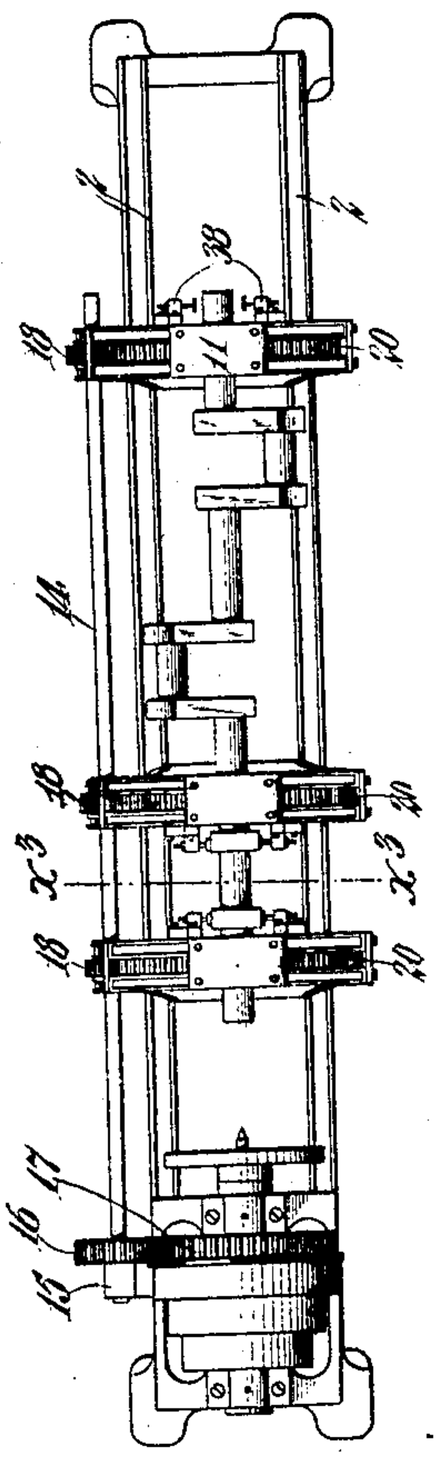
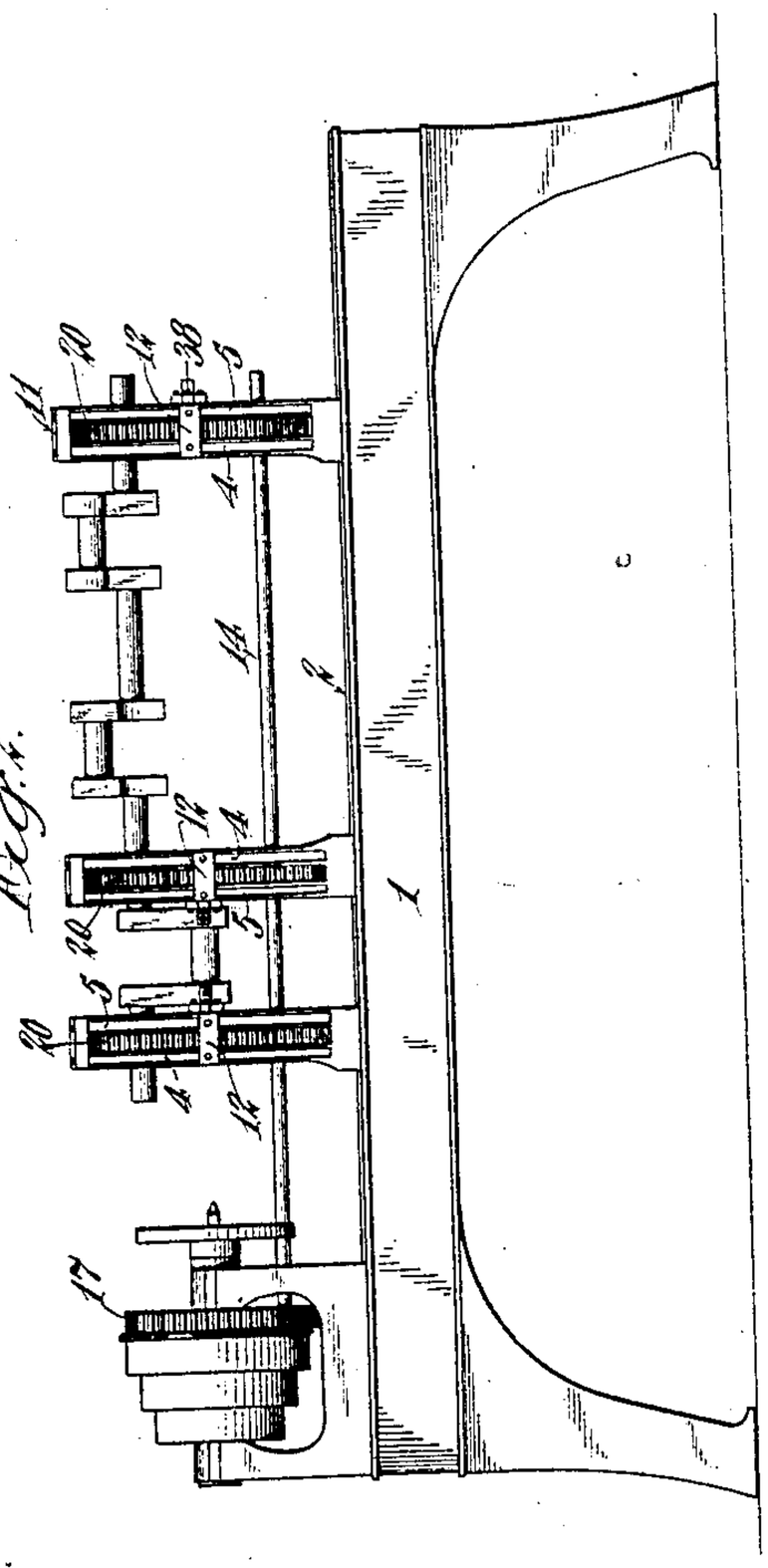


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 4.

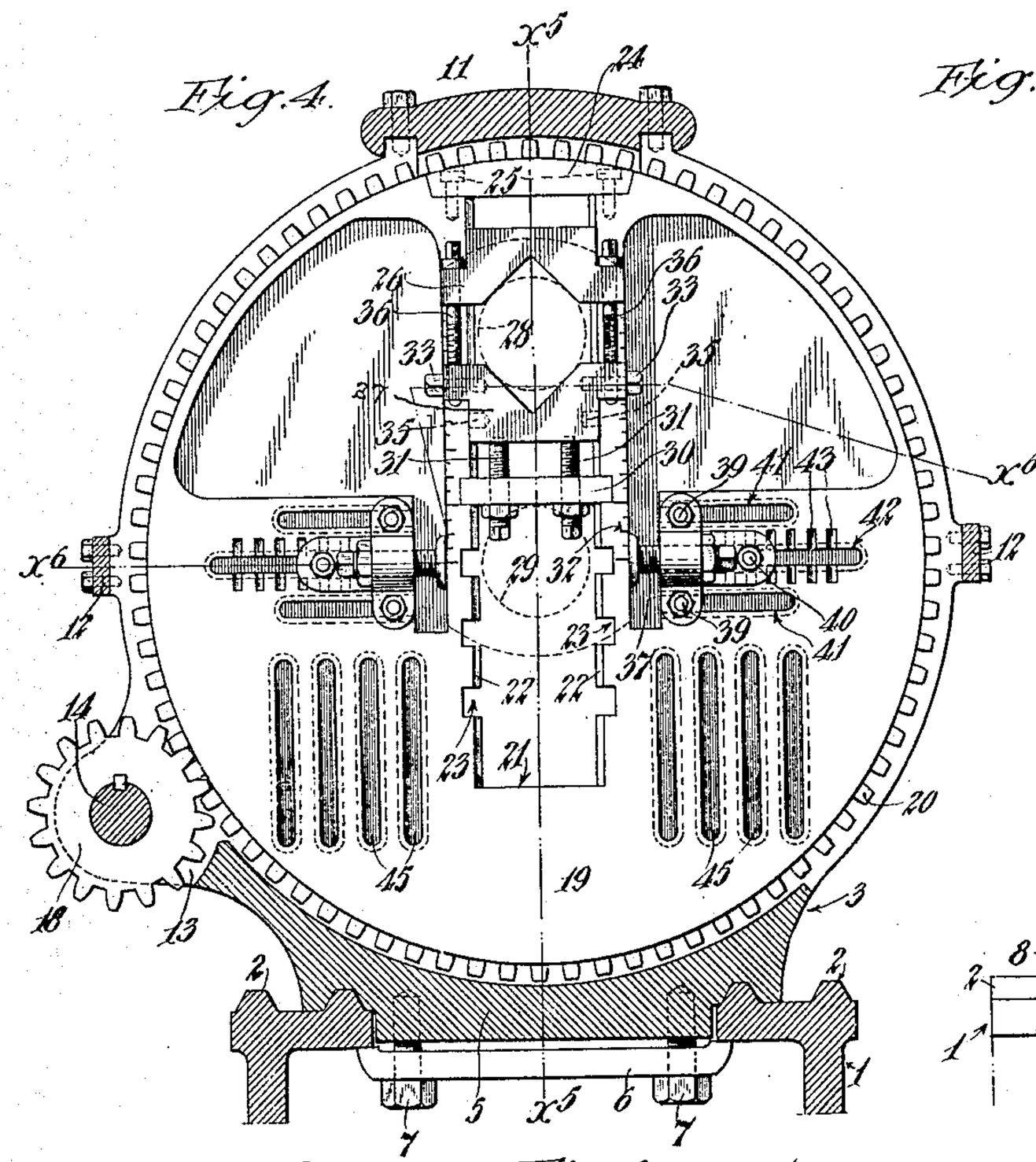


Fig. 5.

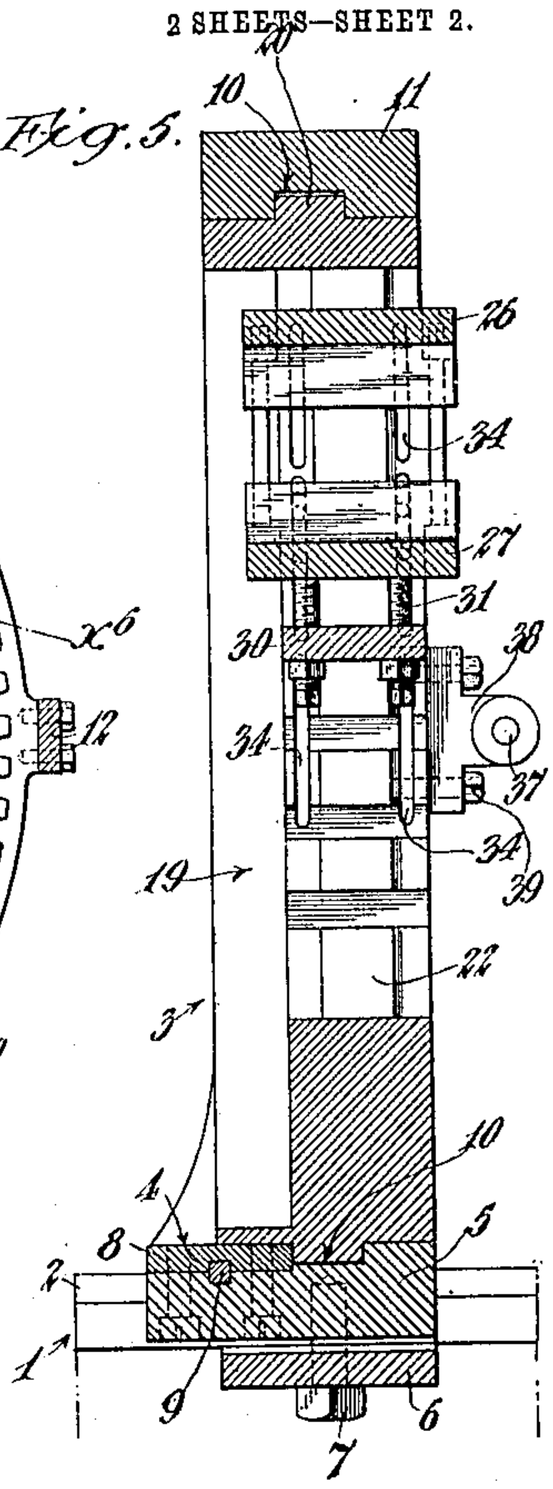
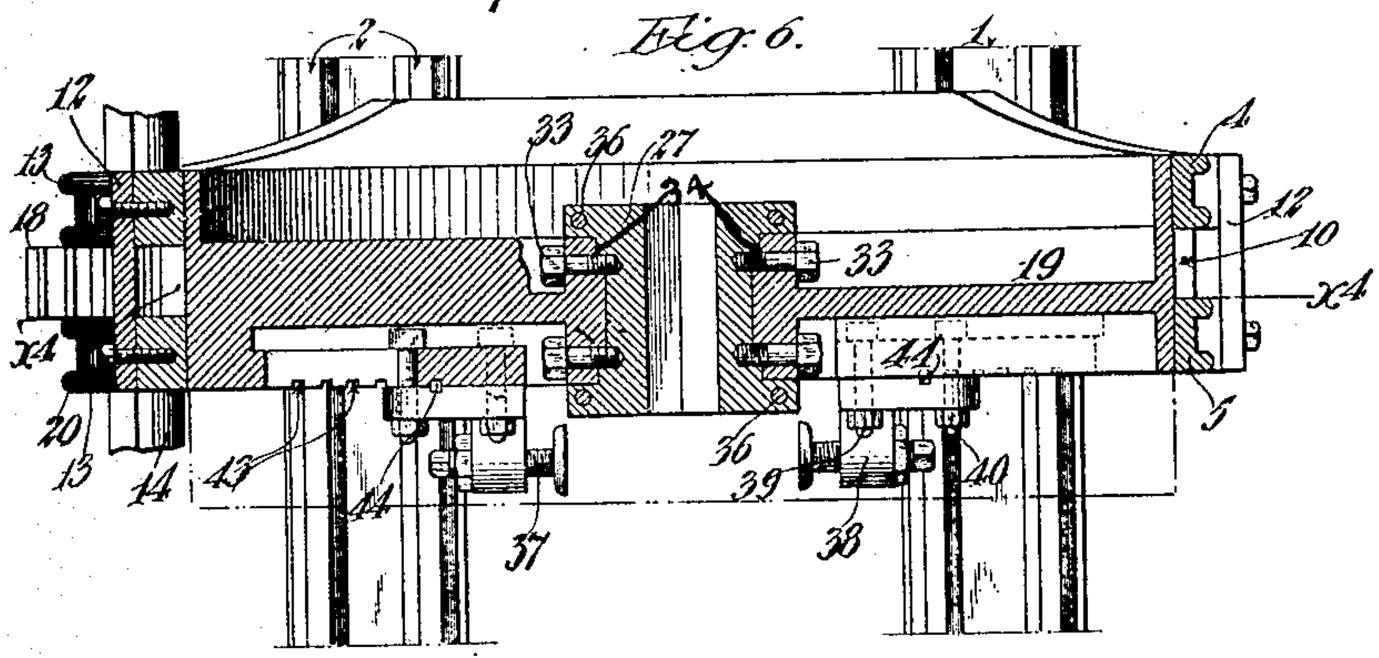


Fig. 6.



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UNITED STATES PATENT OFFICE.

WALTER E. ANDERSON, OF LOS ANGELES, CALIFORNIA.

MACHINE FOR TURNING CRANK-PINS.

No. 916,646. Specification of Letters Patent. Patented March 30, 1909.

Application filed July 11, 1907. Serial No. 383,324.

To all whom it may concern:

Be it known that I, WALTER E. ANDERSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Machine for Turning Crank-Pins, of which the following is a specification.

This invention relates to a machine for turning crank pins, and the objects of the invention are to provide a machine of the character described which is comparatively simple in construction, effective in operation, and which can be applied to a lathe of any well known type without material alteration of the lathe.

Another object is to provide for turning crank pins on a shaft having cranks set at 120 degrees or any degrees apart.

Another object is to provide for removing the crank shaft after one pin has been turned and replacing the crank shaft in the machine in position for turning the next pin without resetting the machine, thereby insuring that the pins will all be turned in line and have the same throw.

Another object is to provide means for quickly setting the machine without making measurements to turn a pin on a crank of any desired throw within the limits of the machine.

Another object is to provide an improved centering device and means for more securely clamping the crank in position.

Other objects relate to details of construction and arrangement which will be hereinafter described.

Referring to the drawings:—Figure 1 is a plan view of a lathe equipped with the invention, a crank shaft having three cranks being shown in position ready for turning. Fig. 2 is a front elevation of what is shown in Fig. 1. Fig. 3 is a section on line x^3—x^3 Fig. 1. Fig. 4 is an enlarged section on line x^4—x^4 Fig. 6. Fig. 5 is a section on line x^5—x^5 Fig. 4. Fig. 6 is a section on line x^6—x^6 Fig. 4.

1 designates the lathe bed having ways 2 upon which is mounted the apparatus comprising the invention. The apparatus consists of two or more units. For example, if a single throw crank pin is being turned, only two units would be employed which would be constructed "right and left", while if the crank was a long crank shaft or had two or more cranks, a third unit would be employed as indicated in Figs. 1 and 2. Inasmuch as these units are similar in construction, one only will be described.

Figs. 4 to 6 show the detailed construction of a unit which comprises a circular casing 3 which consists of two members 4 and 5, both substantially the same in construction except that the casing 5 has a broad foot which is grooved on its under side and slidably mounted on the ways 2 of the lathe, being adjustably held in position thereon by a clamping plate 6 fastened by bolts 7. As clearly shown in Fig. 5, the casing 4 at the bottom has a foot 8 which rests in a seat formed in the casing 5 and a key 9 locks the member 4 against lateral movement on the member 5, and an annular space or groove 10 is formed between the edge of the member 4 and a shoulder on the member 5. The two members 4 and 5 are not continuous rings but each have a segmental gap at the top which is bridged by a cap 11, the latter serving to space the two members 4 and 5 apart at the top and also to hold them together and when in place makes them in effect each a complete ring, the cap 11 being grooved to form a continuation of the groove 10. The members 4 and 5 are further prevented from spreading by intermediate straps 12 which are bolted to the members at diametrically opposite points, as shown in Figs. 4 and 6. Each member 4 and 5 is provided with a lug or bracket 13 forming a journal for a shaft 14. The shaft 14, as shown in Figs. 1 and 2, extends parallel with the lathe, and its head end is mounted in the bracket 15 which is attached to the head of the lathe, the shaft 14 having a pinion 16 which meshes with the usual large gear 17 on the lathe spindle.

Mounted between the two lugs 13 of the associated members 4 and 5 is a pinion 18 splined on the shaft 14 which permits the unit to be shifted along the lathe bed to the position desired.

Mounted to rotate in the members 4 and 5 is a chuck designated, in general, 19 which comprises a disk having on its periphery an external gear 20 which rides in the groove 10, the ends of the teeth clearing the cap 11 and solid portion of the member 5 as shown in Fig. 4, and the gear 20 meshes with the pinion 18 and is revolved thereby. The chuck 19 has a radial slot 21 which extends more than half way through the disk, as clearly shown in Fig. 4, and each wall of the

slot 21 is provided with a way 22 and at intervals notches 23 forming seats are formed transversely at the edges of the slot 21, as clearly shown in Figs. 4 and 5. The slot 21 is bridged and closed by a cap 24 which is detachably secured in place by bolts 25, and the outer face of the cap 24 is provided with teeth to complete the gear 20. Slidably mounted in the slot 21 on the ways 22 is a pair of jaws 26 and 27, each jaw having a V-shaped recess to receive and clamp the shaft designated 28 by dotted lines in Fig. 4, the crank pin being designated 29. A bridge bar 30 which is adapted to be received in any of the seats 23 is provided and a pair of adjusting bolts 31 with lock nuts passed therethrough and enter the seats in the inner jaw 27 and serve to adjust the inner jaw, which adjustment may be facilitated by providing graduations 32 on the disk 19 adjacent the ways 22. To clamp the jaw 27 in place after it has been adjusted, clamping bolts 33 are provided which are screwed in the jaw 27 and pass through slots 34 formed in the raised walls on each side of the slot 21, see Figs. 5 and 6. By employing several seats 23 it is possible to adjust the bridge bar 30 to shift the jaw 27 to various positions for different throws of cranks, and the length of the adjusting screws 31 is sufficient to enable the jaw 27 to be adjusted to any point along the slot 21. The jaw 27 is also provided with an extra set of threaded holes 35 which enables the jaw to be shifted to engage with bolts 33 when the latter reach the ends of their slots. The outer jaw 26 is connected with the inner jaw 27 by bolts 36, by means of which the crank shaft 28 may be clamped between the two jaws, and in clamping the same in place the inner jaw 27 is first set in the proper position which may be readily determined as above described, and then the outer jaw 26 is screwed into place.

In order to positively hold the crank shaft from swinging around in its seat between the jaws 26 and 27, means are provided between which the crank may be received and clamped to hold the crank pin 29 concentric with the chuck. This means comprises a pair of clamping screws 37 arranged on opposite sides of the slot 21, each clamping screw 37 being threaded in a bracket 38 and each clamping screw 37 being provided with a lock nut. The brackets 38 are secured adjustably in place by two bolts 39 and a third bolt 40, see Figs. 4 and 6, the heads of bolts 39 sliding in under-cut slots 41 and the bolt 40 sliding in an under-cut slot 42. The bolts 39 and 40 hold the bracket 38 down flat against the disk 19 and in a measure prevent the bracket 38 from sliding, but to positively insure the bracket against slipping, a series of seats 43 are provided as clearly shown in Figs. 4 and 6, and a key 44 which engages in the seat in the bottom of the bracket 38 is adapted to engage in any of the seats 43. By this means the bracket 38 may be roughly adjusted, after which the screws 37 may be screwed up to give the final adjustment and clamping of the crank to bring the crank pin 29 in a central position. In case a crank pin is being turned which is mounted on a disk instead of on straight bars, as shown, the disk of the crank may be clamped to the chuck 19 by bolts and plates not shown, which bolts may be engaged with any of the under-cut slots 45 in a manner similar to which work is clamped to the face plate of a lathe or to the table of a drill press.

In operation, the units being assembled on the lathe bed, the crank shaft is inserted in the slots 21 by first removing the caps 11, 24 and outer jaws 26, and the inner jaws 27 being set to the desired point the shaft is clamped in place in two of the adjacent units as shown in Fig. 1, the caps 11 and 24 being replaced. In Fig. 1 the extreme right hand unit acts as a steady rest to support the outer end of the shaft. The ordinary carriage and tool post, not shown, are mounted as usual on the ways and lie between the two left hand units, and the shaft 14 being revolved through the medium of gears 16 and 17 in turn imparts rotation to the chucks through the medium of pinions 18 and gears 20, thus driving the crank shaft and rotating the pin to be turned on the center line of the lathe. The right hand unit, it will be observed, also acts to drive the crank shaft in addition to performing its function as a steady rest.

What I claim is:—

1. In a crank pin turning machine, a bed, a radially slotted disk rotatably mounted thereon, the sides of said slot being provided with oppositely disposed pairs of recesses, a bridge piece adapted to be removably seated in said recesses, and clamping means adjustably connected with the bridge piece.

2. In a crank pin turning machine, a bed, a radially slotted disk rotatably mounted thereon, the sides of said slot being provided with oppositely disposed pairs of recesses, a bridge piece adapted to be removably seated in said recesses, two clamping jaws adjustably seated in said slot, one of which is adjustably connected with the bridge piece, and means for locking the last mentioned jaw in its adjusted position.

3. In a crank pin turning machine, a work driver adapted to be clamped to a lathe, and comprising a disk with a radial slot, the walls of which are each provided with a series of notches, a bridge-bar adapted to seat in the notches, a pair of jaws slidable in the slot, adjusting screws in the

bridge-bar engaging the inner jaw, clamping bolts engaging the inner jaw and slidable in slots in the disk, clamping bolts connecting the inner and outer jaws and means for rotating the disk.

4. In a crank pin turning machine, a work driver comprising a rotatable, radially slotted disk having raised walls at the sides of said slot, said walls being slotted longitudinally at right angles to the radial slot, inner and outer clamping jaws adjustably mounted in said radial slot, means for adjusting said jaws, bolts through the slots in said walls engaging with the inner jaws for holding them after they have been adjusted, and means for rotating the disk.

5. In a crank pin turning machine, a work driver adapted to be clamped to a lathe, and comprising a disk with a peripheral gear and having a slot closed by a removable gear section, jaws slidable in the slot for clamping the crank shaft, a casing in which said disk revolves comprising two rings with segmental gaps, a cap closing both gaps, the rings forming an internal annular groove which receives the gear of the disk, and straps connecting the two rings at diametrically opposite points.

6. In a crank pin turning machine, a work driver comprising a casing, a disk revoluble in the casing and having a radial slot, jaws slidable in the slot, the disk having undercut slots extending at right angles to the first slot, brackets with bolts engaging the undercut slots, and clamping screws in the brackets for engaging the crank.

7. In a crank pin turning machine, a work driver comprising a casing, a disk revoluble in the casing and having a radial slot, jaws slidable in the slot, the disk having undercut slots extending at right angles to the first slot, brackets with bolts engaging the undercut slots, clamping screws in the brackets for engaging the crank, key seats in the disk, and a key in each bracket adapted to engage in the key seats.

8. In a crank pin turning machine, a work driver comprising a casing slidable on a lathe bed, a disk in said casing having a main slot to receive the crank shaft, and jaws on said disk for clamping the crank pin to the disk, the disk having slots parallel with the main slot, bolts extending through said slots and engaging the inner jaw, the inner jaw having extra pockets threaded to receive the latter bolts.

9. A driver for a crank pin turning machine comprising a rotatable disk having a shouldered, radial slot extending from its periphery to a point past its center and having parallel, undercut slots in its face adjacent to and parallel with the inner end of said radial slot and oppositely disposed undercut slots adjacent to the center of the disk and at right angles to said radial slot, a portion of said last mentioned slots being provided with seats.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 3rd day of July 1907.

WALTER E. ANDERSON.

In presence of—

GEORGE T. HACKLEY,
FRANK L. A. GRAHAM.