

H. F. NEUMEYER.

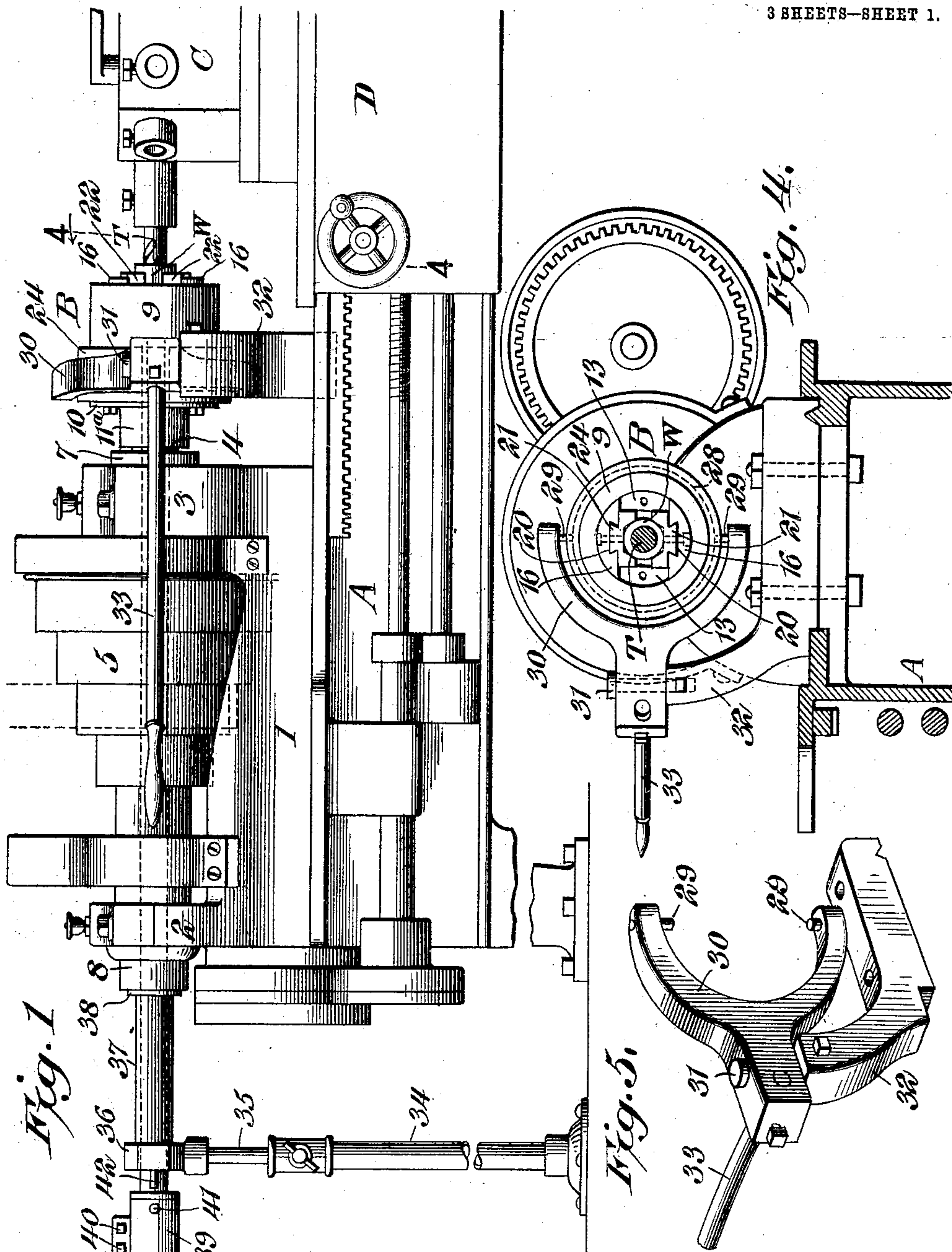
CHUCK.

APPLICATION FILED JULY 12, 1909.

966,850.

Patented Aug. 9, 1910.

3 SHEETS—SHEET 1.



Witnesses

Howard D. Orr.
C. Bradway

Inventor,
Horace F. Neumeyer,
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Attorney

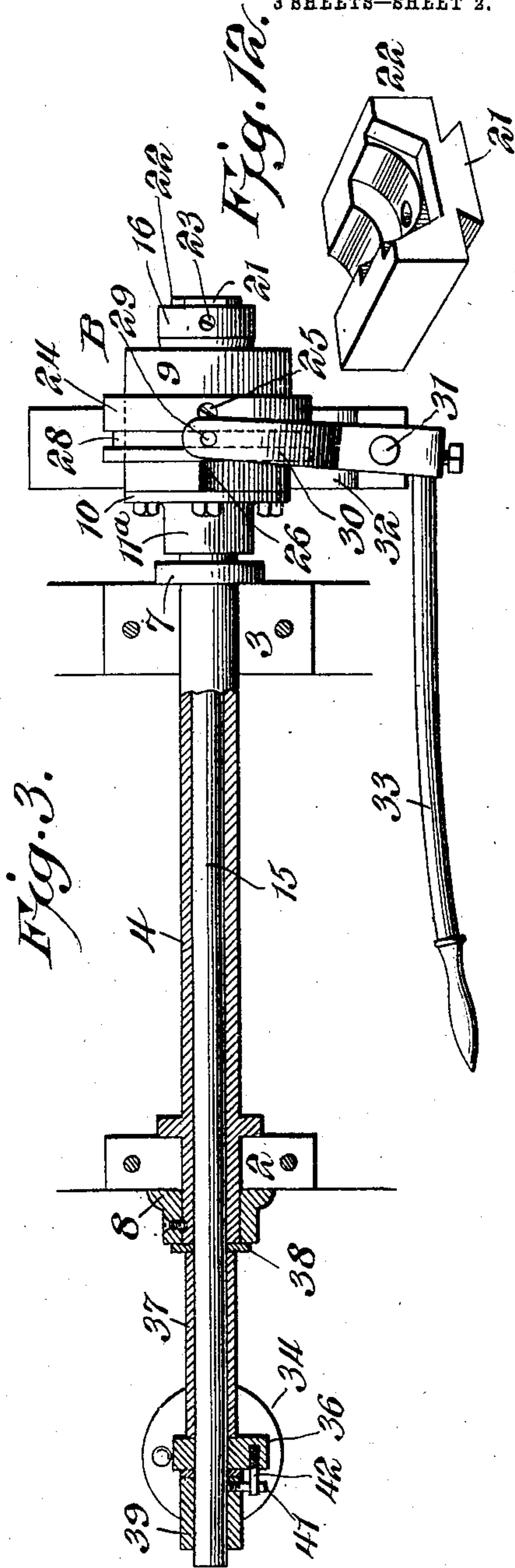
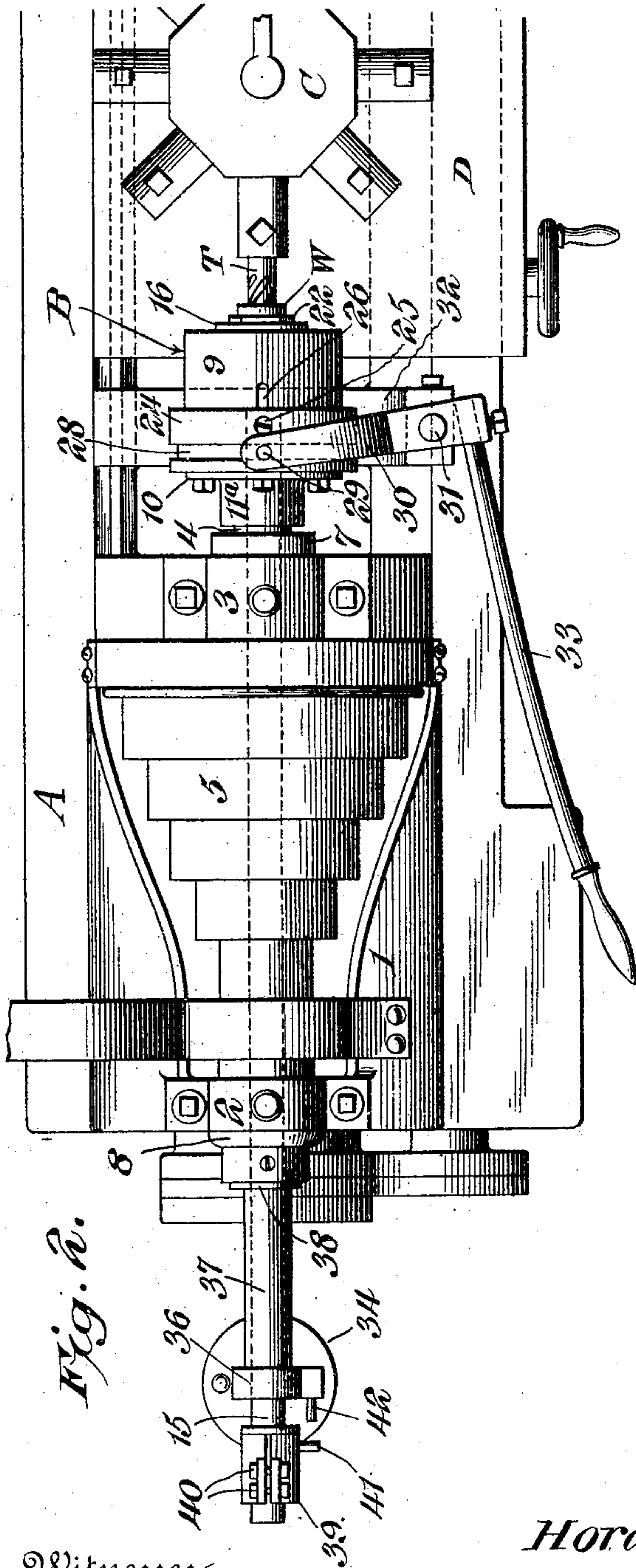
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3 SHEETS—SHEET 2.



Witnesses

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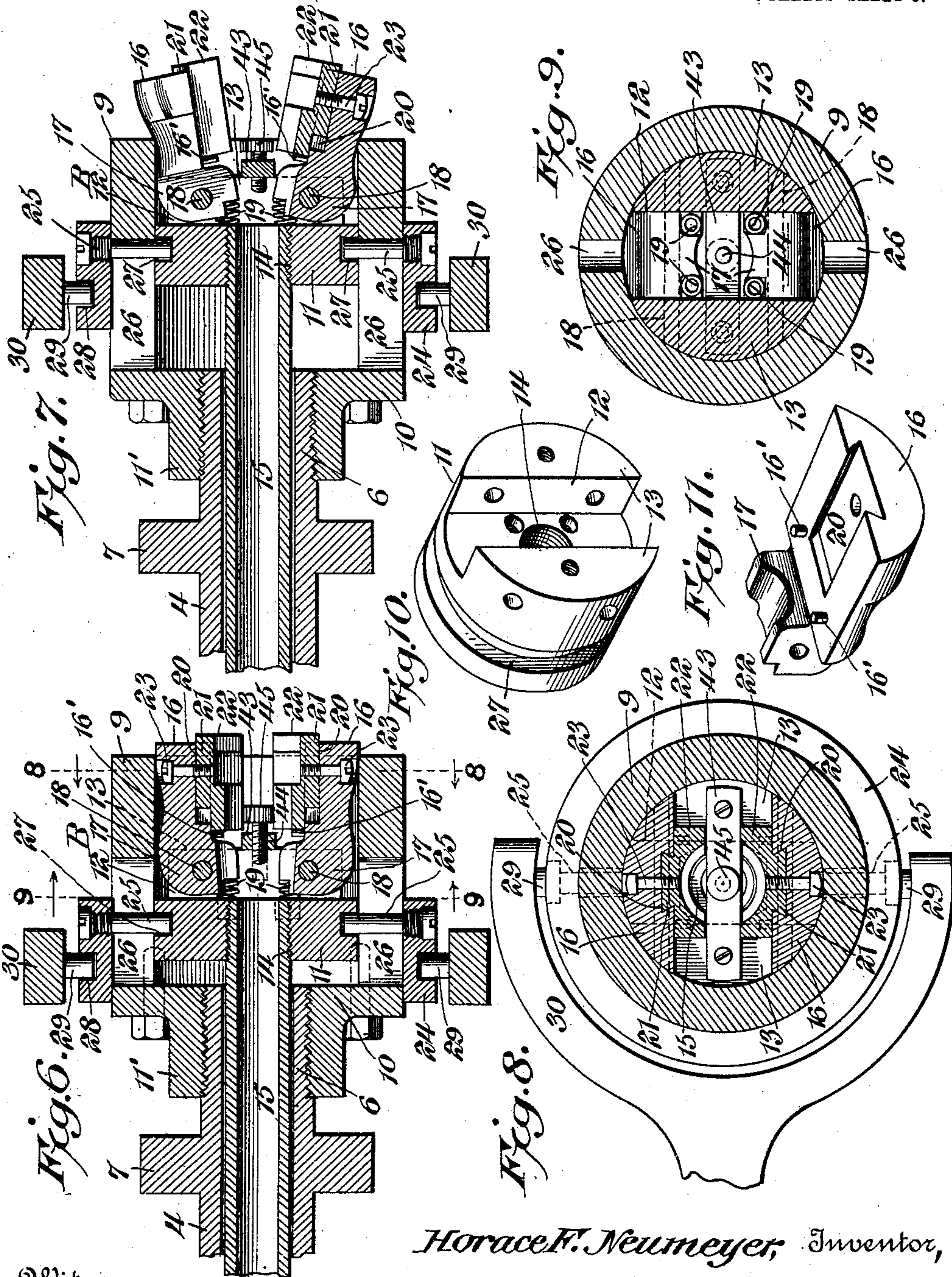
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966,850.

Patented Aug. 9, 1910.

3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

HORACE FALK NEUMEYER, OF MACUNGIE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO WILSON K. MOHR, OF ALLENTOWN, PENNSYLVANIA.

CHUCK.

966,850.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed July 12, 1909. Serial No. 507,122.

To all whom it may concern:

Be it known that I, HORACE F. NEUMEYER, a citizen of the United States, residing at Macungie, in the county of Lehigh and State of Pennsylvania, have invented a new and useful Chuck, of which the following is a specification.

This invention relates to a chuck designed for holding articles in a lathe during the finishing thereof, and relates more particularly to improvements in a chuck of that type disclosed in Letters Patent No. 724,600, granted to me April 7, 1903.

The invention has for one of its objects to improve and simplify the construction and operation of devices of this character so as to be comparatively simple and inexpensive to manufacture, reliable and efficient in use, and so designed as to be used in the nature of an attachment for hollow spindle lathes now in use.

Another object of the invention is the employment of an improved work-gripping means, together with a device for closing the chuck on the work and clutching the same to the live spindle of the lathe, in combination with a brake device for positively arresting the rotation of the chuck when the work is finished and is to be taken out, whereby the dressing or finishing of small articles can be accomplished with great facility and saving of time.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a partial front view of a turret lathe, showing the attachment applied thereto. Fig. 2 is a plan view of Fig. 1, showing the parts in working position. Fig. 3 is a sectional plan view of the attachment, showing the parts in idle position, the stepped pulley or cone being removed from the spindle. Fig. 4 is a vertical transverse section on line 4—4, Fig. 1. Fig. 5 is a perspective view of the operating lever and its supporting bracket. Figs. 6 and 7 are enlarged longitudinal sectional views of the chuck, showing the jaws in closed and open position, respectively, and one of the jaws be-

ing shown in elevation in the latter figure. Figs. 8 and 9 are transverse sections on lines 8—8 and 9—9, Fig. 6. Fig. 10 is a perspective view of the jaw-carrying element of the clutch. Fig. 11 is a perspective view of one of the main jaws. Fig. 12 is a perspective view of one of the auxiliary jaws.

Similar reference characters are employed to designate corresponding parts throughout the views.

In the present instance, I have illustrated the invention in connection with a turret lathe, but it is to be understood that the attachment can be used in connection with other types.

Referring to the drawings, A designates the bed of the lathe on which is secured the head stock 1 having bearings 2 and 3 in which is rotatably mounted the live spindle 4 that carries the cone or stepped pulley 5. The spindle 4 is preferably hollow and its inner end projects beyond the bearing 3 and is threaded at 6 for receiving the chuck designated generally by B. The spindle is prevented from moving longitudinally by collars 7 and 8 engaging the bearings 2 and 3, as clearly shown in Fig. 3. Also mounted on the bed A is the turret head C mounted on a carriage D, both of which may be of the usual construction so that detail description and illustration thereof is deemed unnecessary.

The chuck B comprises a hollow cylindrical body 9 open at its inner end and having a head 10 at its opposite end which has a central opening and a boss 11' at the opening that is internally threaded to screw on the spindle 4. Arranged in the body 9 and movable axially thereof as a disk 11 which, as clearly shown in Fig. 10, has a diametrically-disposed slot 12 leaving opposed flanges 13, and this disk constitutes a jaw supporting element. The disk has a central opening 14 which is tapped so that the disk can be screwed on a tubular shaft or arbor 15 arranged within the spindle 4 to have longitudinal movement. Mounted on the element 11 are two oppositely-disposed jaws 16 which have tongue portions 17 extending into the slot 12, and through these tongues and flanges 13 pass pintles 18 for hingedly mounting the jaws on the element 11. Interposed between the tongue of each jaw and the element 11 is a helical compression spring

19 that serves to throw the jaws outwardly or away from each other. The opposed faces of the main jaws 16 are formed with dovetail recesses 20 for receiving dovetail projections 21 of auxiliary jaws 22 which are of any approved shape, according to the work to be operated on. These auxiliary jaws bear on pins or projections 16' on the jaws 16 and are prevented from longitudinal displacement by means of screws 23 which pass through the main and auxiliary jaws, as clearly shown in Fig. 6, the heads of the screws being countersunk in the outer surfaces of the jaws so that the latter can slide freely inwardly and outwardly through the open side of the chuck body B.

Surrounding the body 9 and slidable thereon is a ring 24 which is provided with inwardly-extending diametrically-disposed pins 25 that pass through slots 26 in the body 9 to engage in a peripheral groove 27 in the jaw supporting element 11, so that the back and forth movement of the ring 24 will cause the jaws to be projected from the chuck body or withdrawn into the same. When the jaws are projected, they spring apart as shown in Fig. 7, for releasing the work and for receiving another piece, and when the jaws are drawn inwardly to the position in Fig. 6, they close on the work and tightly hold the same during the boring, threading or dressing thereof, as the case may be. The ring 24 is itself provided with a peripheral groove 28 in which engage oppositely-disposed pins or projections 29 on a yoke or bifurcated member 30 which is mounted to swing on a vertical pivot 31 carried by a bracket or rest 32 clamped to the bed A of the lathe at a point adjacent the inner end of the head stock 1. The actuating member 30 is provided with a laterally-extending handle 33 arranged in front of the pulley cone, and by moving the handle inwardly, the chuck is opened so as to release the work while the outward movement of the handle closes the chuck to grip the work. The tubular member or rod 15 is of such length as to project out of the outer end of the spindle 4 and the extremity of this rod is steadied by a standard 34, which, as shown in Fig. 1, is mounted on the floor on one end of the lathe, and this standard has an extensible section 35 equipped with a bearing or head 36 in which the rod or member 15 is slidably and rotatably mounted. Interposed between the head 36 and end of the lathe spindle 4 is a spacing sleeve 37 which prevents lateral movement of the standard toward the lathe during the movement of the member 15 at the time the chuck is opened, and interposed between the sleeve 37 and spindle is a bearing washer 38 to prevent excessive wear. On the outer extremity of the member 15 is a split sleeve 39 clamped on the member by tightening bolts 40, and

this sleeve has a radially-extending pin 41 which is adapted to engage a laterally-extending pin 42 on the head 36 so as to thereby abruptly stop the rotation of the member 15 and clutch when the latter is opened so that the work can be taken out without delay.

When articles are to be made from rod stock, the member 15 is preferably tubular so that the rod of metal can be fed inwardly through the same. When small articles are to be finished, a device is applied to the chuck so as to form an abutment for limiting the inward movement of the article and thus facilitate the positioning thereof in the chuck. For this purpose, a cross piece 43 is fastened to the flanges 13 of the jaw supporting element 11 and bridges the slot 12. This cross bar has a central opening 44 in which is threaded a screw 45, the head of which forms an abutment for receiving the inner end of the work. By turning the screw, the abutment can be moved inwardly or outwardly to thereby properly position the work in the auxiliary jaws. This cross bar can be readily detached when tubular stock is to be used in the lathe.

In practice, the parts will be in the position shown in Figs. 3 and 4, when the clutch is opened for receiving the work. After the work is positioned between the auxiliary jaws, the lever or handle 33 is swung outwardly with the result that the ring 24, jaw-carrying element 11 and jaws thereon are moved to the left and at the same time the rod or tubular member 15 is moved in the same direction to thereby disconnect the movable pin 41 from the fixed pin 42 so that the member 15 will be free to rotate as soon as the chuck is closed. At the end of the inward movement of the jaws, the latter will frictionally grip the internal face of the chuck body and be held frictionally engaged by the springs 19 so that the chuck body 9, which is continuously rotating, will impart rotation to the jaws and parts associated therewith. The tool is then brought into engagement with the work by moving the carriage D toward the head stock, thus bringing the drill or other tool T into relation with the work W, which is clutched between the jaws. After the tool has completed its function, the carriage is moved away from the work and the lever 33 moved inwardly to thereby shift the jaws outwardly to release the finished work, and at this time the pin 41 engages the pin 42 to arrest rotation of the jaws, so that the finished work can be removed and a new piece inserted, after which the foregoing operation is repeated.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which

the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

10 Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. The combination of a lathe bed, a head stock mounted thereon, a spindle in the head stock, means for rotating the spindle, a chuck body mounted on the end of the spindle, work-gripping jaws disposed within the chuck body to move longitudinally therein to frictionally engage and turn therewith, a jaw-shifting device disposed externally of the chuck body and immediately adjacent thereto, means mounted on the chuck body for connecting the jaws and the jaw-shifting device, and a support for the jaw-shifting device mounted on the bed under the chuck body.

2. The combination of a lathe bed, a head stock mounted thereon, a spindle in the head stock, means for rotating the spindle, a chuck body secured on the end of the spindle, work-gripping jaws disposed in the body to move longitudinally therein to frictionally engage and turn therewith, a shifting lever, a support for said lever mounted on the bed immediately under the chuck body, and means carried by and extending radially through the chuck body for connecting the lever with the jaws for moving them into and out of engagement with the chuck body.

3. The combination of a continuously rotating element, a second element mounted within the same for longitudinal and rotary movement, jaws mounted on the second element and clutched with the first element by longitudinal movement of the second, means surrounding and rotating with the first element and slidable longitudinally thereon for longitudinally moving the second element to engage the jaws with or disengage them from the first element, and a connection between the said means and second element for permitting the latter to remain idle when the jaws are disengaged and while the first element continues to rotate.

4. The combination of a rotary element, a second element mounted within the same for longitudinal and rotary movement, jaws mounted on the second element and clutched with the first element by longitudinal movement of the second, means surrounding the first element for longitudinally moving the second element to engage the jaws with or disengage them from the first element, and means arranged to operate solely on the second element while the first element continues

to rotate, for arresting rotation of the jaws immediately upon the unclutching thereof from the first element.

5. The combination of a hollow rotatable element, a jaw-carrying member slidably mounted therein, spring-pressed jaws hingedly mounted on the member and serving to clutch the element and member together for rotating the jaws when the member is moved in one direction and for permitting the member to remain idle when the jaws are unclutched and in open position, an operating device located adjacent the element, and a connecting means carried by the element and having a sliding connection with both the member and device for permitting the said means to rotate with the element.

6. The combination of a rotatable element of hollow cylindrical form, means for attaching the same to a lathe spindle, a member slidably mounted in the element, jaws hingedly mounted on the member and arranged to frictionally engage the element when the member is moved in one direction and to disengage the element when the member is moved in the opposite direction, a ring slidably mounted on the element and operatively connected with the member to rotate therewith or independently thereof when the member is idle, and means connected with the ring for shifting the latter on the element to close or open the jaws.

7. The combination of a cylindrical chuck body having oppositely-disposed longitudinal slots, a disk slidably mounted in the body, oppositely-disposed jaws hingedly mounted on the disk, said disk having a peripheral groove, a ring slidably mounted on the body, members on the ring passing through the slot and engaging in the peripheral groove of the disk, springs acting on the jaws for urging the same apart, and means connected with the ring for moving the jaws inwardly or outwardly in the body to clutch the jaws with or unclutch them from the latter.

8. The combination of a cylindrical chuck body having oppositely-disposed longitudinal slots, a disk slidably mounted in the body, oppositely-disposed jaws hingedly mounted on the disk, said disk having a peripheral groove, a ring slidably mounted on the body, members on the ring passing through the slot and engaging in the peripheral groove of the disk, springs acting on the jaws for urging the same apart, means connected with the ring for moving the jaws inwardly or outwardly in the body to clutch the jaws with or unclutch them from the latter, and means for arresting rotation of the jaws simultaneously with the unclutching thereof from the body.

9. The combination of a cylindrical chuck body having oppositely-disposed longitudinal slots, a disk slidably mounted in the

body, oppositely-disposed jaws hingedly mounted on the disk, said disk having a peripheral groove, a ring slidably mounted on the body, members on the ring passing through the slot and engaging in the peripheral groove of the disk, springs acting on the jaws for urging the same apart, means connected with the ring for moving the jaws inwardly or outwardly in the body to clutch the jaws with or unclutch them from the latter, means for arresting the rotation of the jaws simultaneously with the unclutching thereof from the body, said ring having a peripheral groove, and an actuator having a member engaging in the groove of the ring for shifting the latter while permitting rotation thereof on the body.

10. The combination of a chuck body open at one side and having means at the opposite side for attaching the same to a lathe spindle, a disk slidably mounted in the body and formed with opposed flanges and a peripheral groove, opposed jaws having their inner ends engaged between the flanges and hingedly connected therewith, springs interposed between the disks and jaws for forcing the latter apart, and means slidably mounted on the body and engaging in the groove of the disk for moving the latter to carry the jaws inwardly or outwardly to closed or open position.

11. The combination of a chuck body, a member slidably mounted therein, jaws hingedly mounted on the member, means for urging the jaws apart and for clutching the same with the body when the member is in one position, means surrounding and slidably connected with the body to rotate with and slide independently of the latter, and means for holding the member and jaws against rotation when the latter are in unclutched position and when the body and last-mentioned means continue to rotate.

12. The combination of a chuck body, a member slidably mounted therein, main jaws hingedly mounted on the member, means for urging the jaws apart and for clutching the same with the body when the member is in one position, auxiliary work-engaging jaws carried by the main jaws, means connected with the member for simultaneously closing the main jaws and clutching the same with the body, and an adjustable device separate from the first-mentioned means and mounted between the jaws disposed wholly within the chuck body to form an abutment for the work to limit the inward movement thereof, said device being accessible for adjustment from the work-receiving end of the chuck body.

13. The combination of a chuck body, a disk mounted therein and formed with opposed flanges, main jaws hingedly mounted between the flanges, a device removably and adjustably secured to the flanges at a point

between the jaws to form an adjustable abutment for the work, and means for moving the disk to clutch or unclutch the jaws with respect to the chuck body and simultaneously grip or ungrasp the work.

14. The combination of a chuck body having longitudinal slots, a disk mounted therein having a peripheral groove and formed with a diametrically-disposed slot leaving opposed flanges, jaws having tongue portions extending into the slot, pintles passing through the tongue portions and flanges for hingedly connecting the jaws with the disk, said jaws having dovetail recesses in opposed faces, auxiliary jaws having dovetail projections engaging in the said recesses, screws fastening the auxiliary to the main jaws and countersunk in the latter, springs disposed between and pressing on the disk and main jaws for urging the latter apart and effecting a clutching engagement between the main jaws and chuck body, and a jaw-shifting device slidable on and surrounding the chuck body and provided with pins extending through the slots of the latter and engaging in the groove of the disk for shifting the latter to open or close the jaws and unclutch and clutch the same, said pins being arranged to rotate the device with the body when the jaws are in clutched position and to permit the disk and jaws to remain idle when the jaws are in unclutched position.

15. The combination of a chuck body, a disk mounted therein and formed with a diametrically-disposed slot leaving opposed flanges, jaws having tongue portions extending into the slot, pintles passing through the tongue portions and flanges for hingedly connecting the jaws with the disk, said jaws having dovetail recesses in opposed faces, auxiliary jaws having dovetail projections engaging in the said recesses, screws fastening the auxiliary to the main jaws and countersunk in the latter, springs pressing on the main jaws for urging the same apart and effecting a clutching engagement between the main jaws and chuck body, means operatively connected with the disk for shifting the latter to open or close the jaws and unclutch and clutch the same, a cross bar secured to the flanges and extending across the slot of the disk, and an adjustable abutment mounted on the cross bar and located between the jaws to form a stop for the work when inserted between the jaws.

16. The combination of a lathe including a bed, a head stock, a spindle mounted thereon, and means for rotating the spindle, a chuck body connected with the spindle, a longitudinally shiftable member extending through the spindle, a disk attached to the member, jaws hingedly mounted on the disk to frictionally engage the chuck body, an

operating means connected with the disk and mounted on the bed of the lathe to move the member into clutching engagement of the jaws with the said body, and means for
5 arresting rotation of the member when the jaws are unclutched from the body.

17. The combination of a lathe including a spindle and means for driving the same, with a chuck including a rotatable body and
10 work-engaging jaws movable back and forth in the body to be clutched with or unclutched from the same, an element connected with the jaws and extending through the spindle, a vertically extensible standard
15 mounted independently of the latter at one end thereof for supporting the outer end of the element, means for moving the jaws into clutched and unclutched position, and a
20 brake device arranged part on the standard and part on the element for arresting movement of the element and jaws when the latter are moved to open position.

18. The combination of a lathe including a spindle and means for rotating the same,
25 with an element extending through the spindle and projecting out of the ends thereof, a chuck body secured to the spindle, a plurality of work-engaging jaws connected with the element to be clutched with or unclutched
30 from the body by the movement of the element, means for actuating the element, a vertically extensible support independent of the lathe and resting on the floor at one end of the latter and having a bearing at its up-
35 per end for receiving the outer end of the element, and a device on the element arranged to engage the support for abruptly arresting the rotation of the element as soon as the jaws are unclutched from the chuck
40 body.

19. The combination of a lathe spindle, means for driving the same, a chuck body secured to the spindle, jaws mounted in the body and movable into and out of clutching
45 engagement therewith, a carrier for the jaws, a member connected with the carrier and extending through the spindle, an adjustable standard having a head at its upper end in which the member is rotatably and slidably
50 mounted, a projection on the head, a projection on the member arranged to engage the projection on the head for arresting rotation of the member when the jaws are unclutched, and means for simultaneously moving the
55 jaws and member to clutch or unclutch the jaws.

20. The combination of a lathe spindle, means for driving the same, a chuck body se-

cured to the spindle, jaws mounted in the body and movable into and out of clutching
60 engagement therewith, a carrier for the jaws, a member connected with the carrier and extending through the spindle, an adjustable standard having a head at its upper end in which the member is rotatably and slidably
65 mounted, a projection on the head, a projection on the member arranged to engage the projection on the head for arresting rotation of the member when the jaws are unclutched, means for simultaneously moving
70 the jaws and member to clutch or unclutch the jaws, and a bracing sleeve on the member and interposed between the head of the standard and end of the spindle.

21. The combination of a lathe bed, a head
75 stock thereon, a spindle mounted in the head stock, means for rotating the spindle, a chuck body secured on the end of the spindle, work-gripping jaws mounted in the chuck
80 body and shiftable longitudinally to engage and disengage the chuck body for rotation therewith, a device surrounding the chuck body to rotate therewith and shiftable
85 axially thereon, said device having an annular groove, a bifurcated lever spanning said device and having members engaging in the said groove at diametrically opposite points, a support for the lever mounted on the bed immediately adjacent the chuck
90 body, and means for operatively connecting the device surrounding the chuck body with the work-gripping jaws.

22. The combination of a lathe bed, a head
95 stock thereon, a spindle mounted in the head stock, means for rotating the spindle, a chuck body secured on the end of the spindle, work-gripping jaws mounted in the chuck body and shiftable longitudinally to engage and
100 disengage the body for rotation therewith, a device surrounding the chuck body to rotate therewith and shiftable axially thereon, said device having an external annular groove, connections between said device and the work-gripping jaws, a shifting device hav-
105 ing members engaging in said external annular groove, and a support for said shifting device mounted on the body immediately adjacent the clutch body.

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

HORACE FALK NEUMEYER.

Witnesses:

LIZZIE KNAUSS,
DAVID J. NAGLE.