

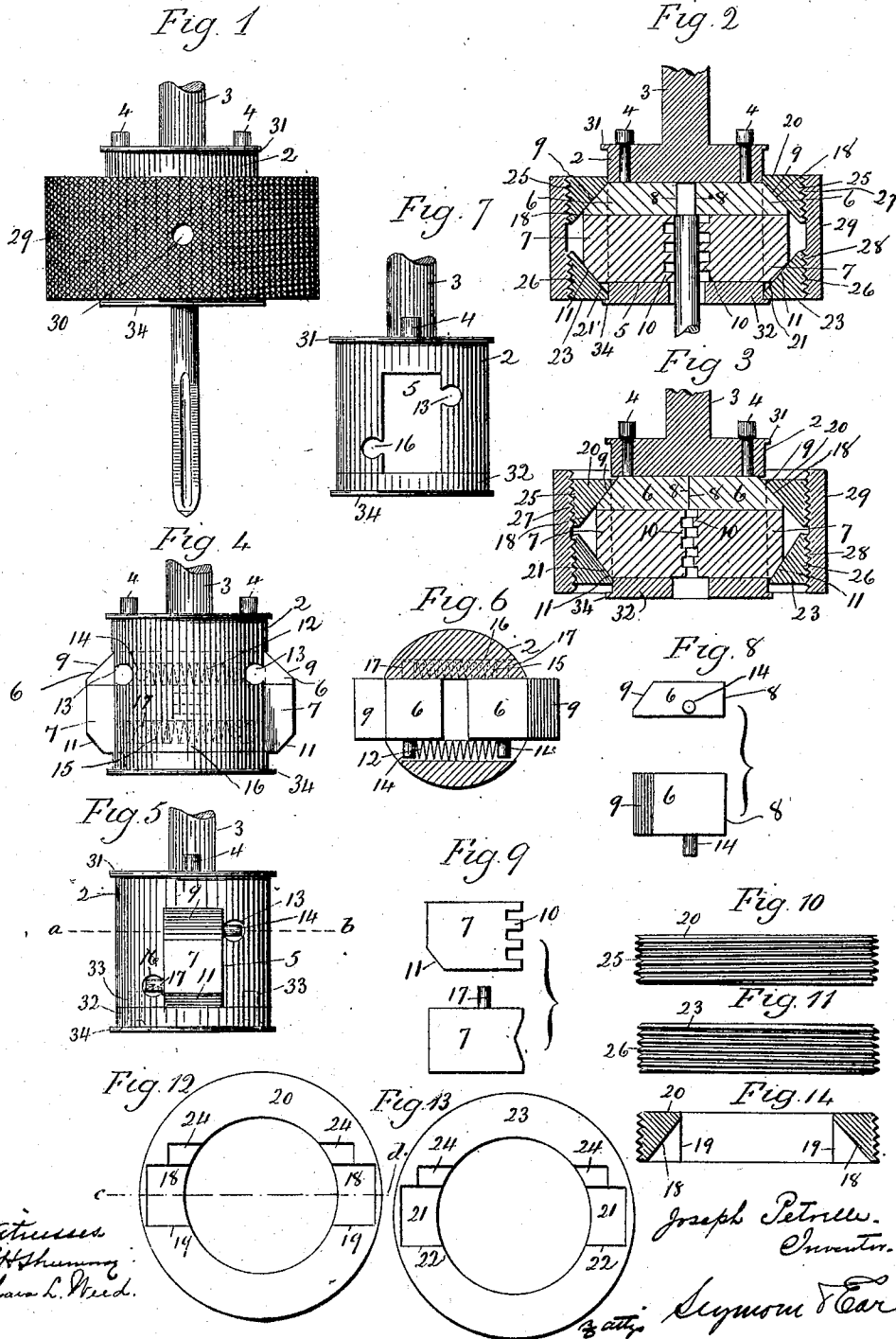
No. 823,545.

PATENTED JUNE 19, 1906.

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CHUCK.

APPLICATION FILED MAR. 1, 1905.



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CHUCK.

No. 823,545.

Specification of Letters Patent.

Patented June 19, 1906.

Application filed March 1, 1905. Serial No. 247,852.

To all whom it may concern:

Be it known that I, JOSEPH PETRELLI, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improved Chuck; and I do hereby declare the following, when taken in connection with the accompanying drawings and the numerals of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of a chuck constructed in accordance with my invention with its stem broken away and shown as provided with a tap; Fig. 2, a view of the chuck in vertical central section with its stem broken away and showing both its front and back jaws engaged with the tap the bit of which is broken away; Fig. 3, a corresponding view with the tap removed and both pairs of jaws fully closed; Fig. 4, a detached view, in side elevation, of the chuck-body, showing it as provided with both pairs of jaws, which are looked at flatwise or in side elevation; Fig. 5, a similar view showing the jaws looked at endwise or in end elevation; Fig. 6, a view in transverse section on the line *a b* of Fig. 4 through the chuck-body showing the back jaws in plan; Fig. 7, a view in side elevation with the chuck-body as it appears when entirely stripped. Fig. 8 comprises a view in side elevation and a plan view of one of the back jaws; Fig. 9, a view in side elevation and a plan view of one of the front jaws; Fig. 10, a view in side elevation of the front operating-ring, which is formed with a right-hand peripheral thread; Fig. 11, a corresponding view of the back operating-ring, which is formed with a left-hand peripheral thread; Fig. 12, a view in inside elevation of the front operating-ring; Fig. 13, a corresponding view of the back operating-ring; Fig. 14, a view on the line *c d* of Fig. 12.

My invention relates to an improvement in that class of chucks commonly used for drilling and tapping, the object being to produce a simple, compact, and convenient device having two sets of jaws constructed and arranged to be differentially moved so as to grip different portions of the drill or tap, according to the diameter thereof at the point engaged. For instance, a tap having a round and a squared portion will be gripped and

held by its squared portion and centered by its round portion.

With these ends in view my invention consists in a chuck having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention as herein shown I employ a cylindrical body 2, having a stem or shank 3, by means of which the chuck is secured in place in a drill press or lathe in the usual manner. To adapt it to be used on a screw-machine, the said body may be furnished, as shown, with coupling-pins 4 for engagement by a slip-collet, which, being commonly used and well understood, is not shown. The said body 2 is formed with a deep chamber 5, extending transversely through it, having parallel side walls and receiving a pair of back jaws 6 and a pair of front jaws 7. The said jaws 6 are formed with square gripping edges 8 at their inner ends and with operating-bevels 9 at their outer ends, while the said jaws 7 are formed at their inner ends with interlocking teeth 10 and at their outer ends with operating-bevels 11. However, the particular construction of the jaws may be varied as required. The back jaws 6 are constantly pushed away from each other by means of a spiral spring 12, located in a bore 13 in the body 2 and engaging at its ends with pins 14, carried by the jaws and projecting into the said bore. The front jaws 7 are constantly pushed apart by a corresponding spring 15, located in a corresponding bore 16 and engaging at its ends with pins 17, mounted in the sides of the said jaws 7. The back jaws 6 are forced together against the tension of the spring 12 by the engagement with the bevels 9 at their outer ends of cam-surfaces 18 produced by forming inclined slots 19 opposite each other in the inner face of a back operating-ring 20, the said slots 19 corresponding in width to the width of the said back jaws. The said ring 20 is adapted in its internal diameter to slip over the body 2, on which it is free to slide lengthwise, but on which it is held against rotation by the entrance of the outer ends of the jaws 6 into its slots 19. The jaws 7 are forced inward against the resistance of the spring 15 by the engagement with the bevels 11 at their outer ends of cam-surfaces 21, formed by cutting inclined slots 22 in the inner face

of a front operating-ring 23, mounted upon the outer end of the body 2 and sliding lengthwise thereupon, but held against rotation thereupon by the entrance into its slots 22 of the outer ends of the jaws 7, the said rings 20 and 23 corresponding to each other in internal and external diameter and in thickness. The said rings 20 and 23 also have their inner faces cut away, as at 24, for the clearance of the spring-pins 14 and 17 of the jaws 6 and 7.

The external periphery of the ring 20 is formed with a right-hand screw-thread 25, while the external periphery of the front ring 23 is formed with a left-hand screw-thread 26. These screw-threads 25 and 26 are respectively engaged by a right-hand screw-thread 27 and a left-hand screw-thread 28, formed upon the inner surface of a knurled sleeve 29, by means of which both pairs of jaws are operated. By preference this sleeve is formed with a hole 30 for the reception of the pin of a spanner-wrench to be used when it is desired to lock the jaws tighter than can be done by the hand alone. At its inner end the body is formed with a flange 31 for limiting the outward movement of the back ring 20. The jaws 6 and 7 are confined within the chamber 5 by means of a plate 32, held in place by screws 33 and formed with a stop-flange 34, which limits the outward movement of the front ring 23.

It will be understood from the foregoing that when the sleeve 29 is turned the operating-rings 20 and 23 will be simultaneously moved toward each other or away from each other, according as it is turned in one direction or the other, provided both are free to move. If only one ring is free to move, it will move toward and away from the other ring, which will then constitute a point of purchase for the operation of the other set of jaws. If, for instance, a drill having a shank of uniform diameter is inserted into the chuck, then when the sleeve is turned the inner ends of the jaws of both pairs of jaws will be advanced at the same speed until they engage with the drill, which they will then hold against rotation and also center. Then when the sleeve is reversed the jaws of both pairs of jaws will be retired at the same speed to release the drill. On the other hand, taps are almost invariably formed with short square tangs at their butt-ends. Therefore when a tap is inserted into my improved chuck and the sleeve is turned the back and front jaws move inward at the same speed until the front jaws engage with the full diameter of the tap, after which the front jaws will stop moving inward and the front ring will by them be held against further sliding movement on the body 2. Being so held it forms, as it were, a point of purchase for the sleeve to pull against in moving and sliding the other ring to effect the inward movement of the back jaws until they have been closed

upon the flat faces of the tang, whereby the tap is positively held against rotation by the back jaws, while the front jaws, although they also assist in holding it against rotation, really perform a centering function. Of course, if it is desired, drills may be formed with flat tangs, and thus be adapted to be held as rigidly as taps.

From the foregoing it appears that when the sleeve is turned the operating-rings are normally moved toward each other or away from each other at the same rate and that the jaws are moved correspondingly inward or outward. However, when either the front jaws or the back jaws are in their inward movement brought into their closed positions or closed upon the shank of a drill or tap then the jaws so closed together and so stopped will lock the ring by which they are operated against rotation, and this ring when so locked will constitute a point of purchase for the other ring, which will be caused to slide in one direction or the other on the body, and so operate to close its jaws. It will be equally clear that it is not necessary to use both pairs of jaws, as prior to introducing a drill or tap into the chuck the sleeve may be operated so as to bring the back jaws together and form an abutment for the butt-end of the drill or tap, which will in that case be held solely by the front jaws.

It is apparent that in carrying out my invention some changes from the construction herein shown and described may be made. I would therefore have it understood that I do not limit myself thereto, but hold myself at liberty to make such departures therefrom as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a chuck, the combination with a chambered body, of a back and a front pair of jaws, two operating-rings mounted upon the said body upon which they are free to slide and respectively coacting with the said jaws; and unitary means free to move longitudinally of the axis of the chuck except for the restraint of the said rings and coacting with the said rings to cause them to approach or separate from each other, whereby the jaws are simultaneously or successively brought to bear upon the piece to be held.

2. In a chuck, the combination with a chambered body, of a back and a front pair of jaws located therein, each jaw having a bevel at its outer end, two operating-rings mounted upon the said body upon which they are free to slide, one ring coacting with the bevels at the outer ends of the jaws of one pair and the other ring coacting with the bevels at the outer ends of the jaws of the other pair; and unitary means free to move longitudinally of the axis of the chuck except

for the restraint of the said rings and coacting with the said rings to cause them to approach or separate from each other, whereby the jaws are simultaneously or successively brought to bear upon the piece to be held.

3. In a chuck, the combination with a chambered body, of a back and front pair of jaws located therein, two operating-rings mounted to slide upon the said body and respectively adapted to coact with the outer ends of the jaws of the said pairs of jaws, and one ring being formed with a peripheral right-hand thread and the other with a peripheral left-hand thread, and an operating-sleeve having corresponding internal right and left hand threads for the operation of the said rings.

4. In a chuck, the combination with a chambered body, of a back and front pair of jaws located therein, each jaw having a bevel at its outer end; two operating-rings mounted to slide upon the said body and adapted to coact with the bevels at the outer ends of the said jaws, and one ring being formed with a peripheral right-hand thread and the other with a peripheral left-hand thread; and an operating-sleeve having corresponding internal right and left hand threads for the operation of the said rings.

5. In a chuck, the combination with a chambered body, of a back and front pair of jaws located therein, springs for forcing the jaws outward in the said body, two operating-rings sliding upon the said body and respectively coacting with the said jaws, and one ring being formed with a peripheral right-hand thread and the other with a peripheral

left-hand thread; and an operating-sleeve having correspondingly internal right and left hand threads for the operation of the said rings.

6. In a chuck, the combination with a chambered body, of a back and front pair of jaws located therein, two operating-rings sliding upon the said body and receiving the outer ends of the jaws of the said pairs of jaws, and one ring being formed with a peripheral right-hand thread and the other with a peripheral left-hand thread; and an operating-sleeve having correspondingly internal right and left hand threads for the operation of the said rings.

7. In a chuck, the combination with a chambered body, of a back and front pair of jaws located therein, each jaw being formed at its outer end with a bevel, two operating-rings sliding upon the said body and having their inner faces slotted to receive the outer ends of the said jaws with the bevels of which the bottom walls of the slots coact to move the jaws inward, and one of the said rings being formed with a peripheral right-hand thread and the other with a peripheral left-hand thread; and an operating-sleeve having correspondingly internal right and left hand threads for the operation of the said rings.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSEPH PETRELLI.

Witnesses:

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GEORGE D. SEYMOUR.