J. POWELL.

CHUCKS FOR GAS AND WATER FITTINGS.

No. 189,652. Patented April 17, 1877.

FIG. 1.

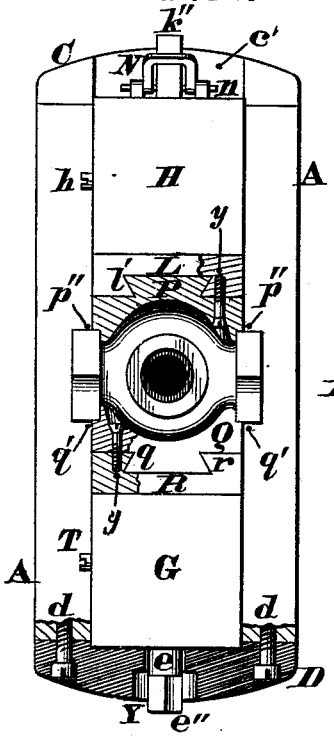


FIG. 4.

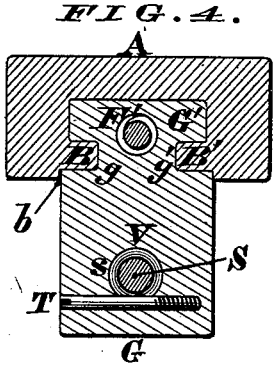


FIG. 5.

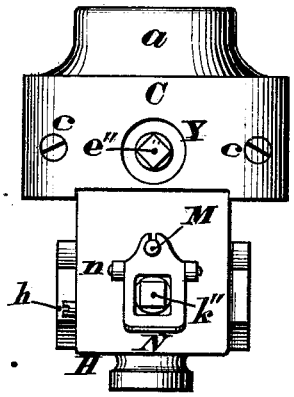


FIG. 6.

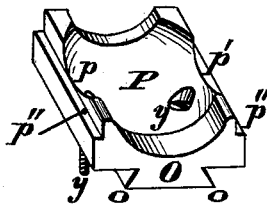


FIG. 9.

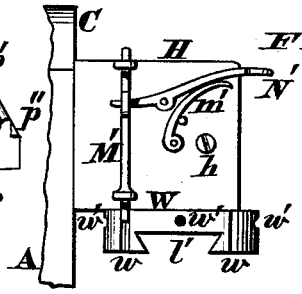


FIG. 7.

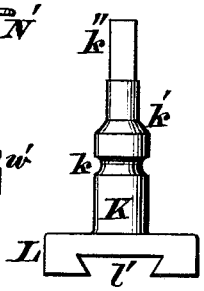


FIG. 2.

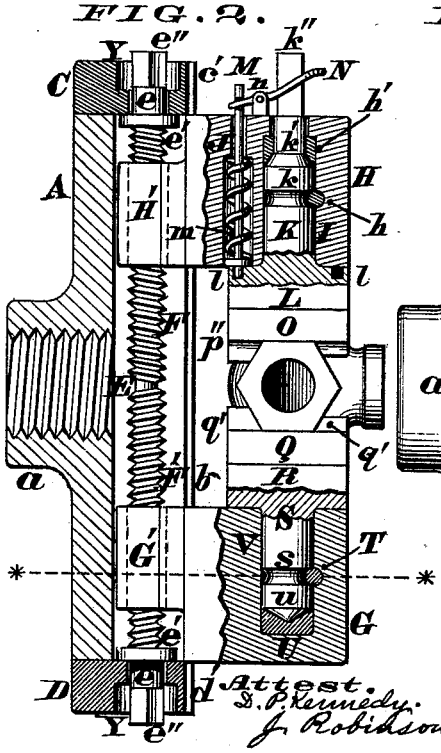


FIG. 3.

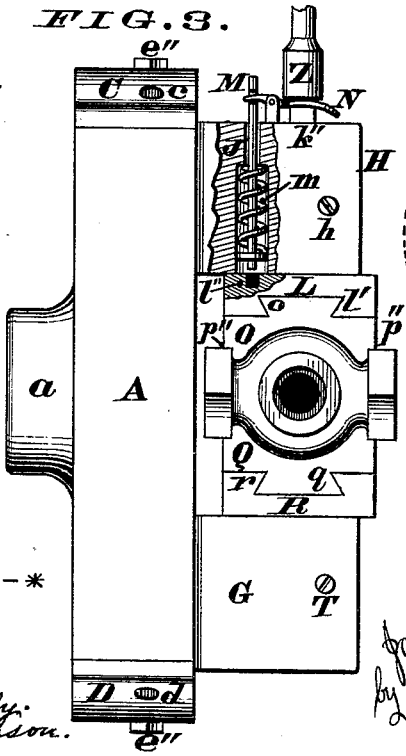


FIG. 8.

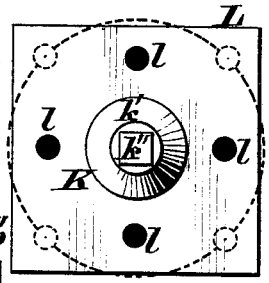
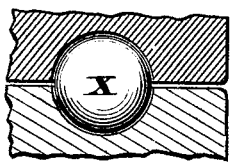


FIG. 10.



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James Powell
by Jas. H. Layman.
his Attorney.

UNITED STATES PATENT OFFICE.

JAMES POWELL, OF CINCINNATI, OHIO.

IMPROVEMENT IN CHUCKS FOR GAS AND WATER FITTINGS.

Specification forming part of Letters Patent No. **189,652**, dated April 17, 1877; application filed January 5, 1877.

To all whom it may concern:

Be it known that I, JAMES POWELL, of Cincinnati, in the county of Hamilton, and State of Ohio, have invented new and useful improvements in chucks for holding valves or cocks or other fittings while being dressed, which improvements are fully set forth in the following specification, and accompanying drawing, in which latter—

Figure 1 is a front elevation of my device, showing a globe-valve grasped in the chucks, the neck of said valve being presented for the action of the finishing-tool. Fig. 2 is a vertical section of the same. Fig. 3 is a partially sectionized side elevation of the device, a socket-wrench being shown as applied to the stem or spindle of the upper table, and the two chucks represented as rotated one fourth of a revolution, thereby presenting one of the pipe-ends of the valve to the action of the finishing-tool. Fig. 4 is a horizonal section at the line * *. Fig. 5 is a plan of the device. Fig. 6 is a perspective view of one of the detachable chucks removed from its holder or table. Fig. 7 is an elevation of the upper table removed from its appropriate jaw. Fig. 8 is an enlarged plan of said table, and Figs. 9 and 10 show modifications of the invention.

This invention relates to that class of chucks which are capable of being temporarily coupled to the head-stock of a turning-lathe to facilitate dressing or finishing the two pipe-ends and the necks of globe-valves, cocks, and similar devices, without removing the valve from the chuck; and the first part of my improvements comprises the following combination of appliances.

The chucks proper consist, preferably, of two metallic plates, suitably recessed or excavated to embrace the spherical portion or shell of the valve, or cock, or other fitting, said plates being also adapted to grasp the valve around its square or other non-circular ends, and thereby hold it in the most firm and secure manner while being dressed. These embracing-chucks are provided with dovetail tongues or tenons that engage readily with undercut grooves in the opposing faces of two flat tables or chuck-holders, said tables being each furnished with a cylindrical stem or shank, or spindle fitting in suitable sockets in two opposing and adjustable jaws.

Said jaws are confined to a rectilineal path by being applied to a grooved cross-head or box, or housing, which latter is capable of being readily united to the head-stock of any ordinary turning-lathe, as will presently appear. This box or plate or housing has journaled in it a shaft, upon which is chased a right and left hand screw, which reversely-pitched threads engage with the nutted portions of the opposing jaws, and, by properly manipulating or rotating said shaft, these jaws are compelled to advance simultaneously toward each other, or to recede in the same manner, as may be required. One of these jaws carries a spring-bolt, or its equivalent locking device, capable of engaging with one of a series of sockets in the flat or ungrooved surface of the table that is applied to said jaw. The object of this spring-bolt is to temporarily lock said table in either one of a series of predetermined positions, thereby securely retaining the valve, or cock, or other fitting in the proper place to be operated on by the appropriate dressing-tool or other implement. The second part of my improvements comprises a novel combination and location of devices, whereby the application of an ordinary socket-wrench performs the twofold purpose of dislodging the spring-bolt from the table, and also of rotating said table, and, with the latter, the chucks and the valve grasped between them.

To accomplish this result I cause the upper end of the spring-bolt to project through the top of the jaw, and then couple this projecting end to a pivoted lever or latch, which latter has its free end located near the center of the jaw or in close proximity to the extremity of the spindle of the socketed table. Now, by simply forcing the socket-wrench down on the non-circular extremity of the aforesaid spindle, the free end of the lever will be at once depressed, thus elevating the spring-bolt far enough to disengage it from the table, which latter is then at liberty to be turned either to the right or left by said wrench.

The third part of my invention consists in fitting in each jaw a steel or other hard-metal plate, which plates serve as bearings for the

spindles or stems of the rotating tables or chuck-holders, as hereinafter more fully described.

The principal member of my device consists of a stout box or frame or cross-head, or other suitable housing, A, having a rearwardly-projecting and screw-threaded boss, *a*, wherewith said housing is temporarily, but securely, coupled to the head-stock of a turning-lathe, so as to rotate therewith. This box or bearing, which may be of any convenient shape, is rabbeted longitudinally at *b*, and provided with two opposite and parallel tongues, B B′, which devices *b* and B B′ guide in a proper path two shiftable jaws, that will be presently be described. These tongues B B′ are shown more clearly in Fig. 4.

Attached to the ends of this housing A, by screws *c d*, are caps C D, whose rabbeted faces *c′ d′* are flush with rabbet *b*.

These caps have journaled in them the unthreaded stems *e* of a shaft, E, which latter has chased upon it a right-hand screw, F, and and a left-hand thread, F′, as seen in Fig. 2. Collars *e′* on said shaft bear against the inner faces of caps C D, and non-circular shanks *e″* enable the convenient rotation of the device E F F′ upon the application to either of these shanks of any suitable socket-wrench.

Of these reversely-pitched screws the one F′ engages with nut G′ of a jaw, G, grooved at *g g′* to receive the tongues B B′ of housing A, as seen in Fig. 4. The other screw, F, engages with nut H′ of a similar, but opposing, jaw, H, which is grooved in the same manner as is jaw G.

The upper jaw H H′ is chambered out at I, to contain the cylindrical stem or spindle K of the upper chuck-holder or table L, which spindle may be either cast with or otherwise secured to said table. Stem K is grooved circumferentially at *k* to receive a pin, screw, or other retaining device, *h*, apable of coupling said stem to the jaw in such a manner as to allow the free rotation of the members K L as soon as said table is unlocked from jaw H. Furthermore, said stem is furnished with an inclined or beveled shoulder, *k′*, and a non-circular shank, *k″*, as more clearly seen in Fig. 7. This beveled shoulder *k′* seats against a steel or other hard-metal bearing, *h′*, as seen in Fig. 2, which bearing-plate is located at the upper end of chamber I. A bore, J, in jaw H, and preferably in the rear of spindle K, is traversed by a bolt, M, that is maintained in its normal or depressed position by a spiral or any other suitable spring, *m*. The upper end of bolt M takes hold of a lever or latch, N, pivoted to jaw H at *n*.

This latch is preferably slotted at its forward end, to permit the square shank *k″* of spindle K passing through said lever, as seen in Fig. 5. The lower end of bolt M is adapted to enter either one of a series of sockets or pockets, *l*, in the ungrooved surface of rotating table or chuck-holder L, whose opposite face is provided with a dovetailed groove, *l′*, to receive the correspondingly-shaped tongue *o* of the upper chuck O, although this tongue and groove may be omitted and any other convenient devices may be substituted for them.

Chuck O is recessed at P to embrace the shell or globe or other spherical portion of the valve or cock or other article to be finished, and the chuck is notched at *p p′* to fit around the valve near its pipe-ends.

Flat ledges or bearings *p″* prevent any rotation of the cock by grasping the square or hexagonal or octagonal terminations that are customarily cast at the pipe ends of most valves and cocks.

The lower chuck Q is constructed in a precisely similar manner, and is furnished with a dovetail tenon or tongue, *q*, that enters groove *r* of the lower chuck holder or table R, whose spindle or stem S is grooved circumferentially at *s*, to receive the pin or screw T, which latter is inserted in the lower jaw G. This lower chuck Q is provided with two horizontal ledges, *q′*, precisely similar to the ones *p″* of the upper chuck, and like said upper chuck the one Q is recessed and notched, so as to grasp the shell of the valve or other fitting in a very secure manner. Spindle S terminates with a conical point, *u*, whose bearing consists of a hard-metal plate, U, at the end of chamber V of the lower jaw G.

The upper table or chuck holder may be of disk shape, as shown at W, and the periphery of said disk or wheel can be provided with notches *w*, to receive a modified form of locking device, M′. In this case the bolt M′ is located alongside the jaw H, and is operated by an external spring, *m′*, that exerts an upward pressure against the lever or latch N′, which latter is adapted to be operated by hand, and not by a socket-wrench. Furthermore, this disk is furnished with radial sockets *w′*, to receive any suitable pointed implement wherewith to rotate said circular table. Or, the locking device M may be arranged to operate in a horizontal plane, and be capable of engagement with either of said radial sockets *w′*, or with other depressions or pits in the wheel or disk W.

Y are counterbores in caps C and D, to receive the socket-wrench Z, which latter is of such size and shape as to fit readily upon the shank *k″* of spindle K, as seen in Fig. 3.

y are screws wherewith the detachable chucks O and Q are coupled to their respective rotable tables L and R, in such a manner as to maintain the cock in its proper position while being finished, and, if preferred, the dovetail attachments *o l′ r q* may be dispensed with when said screws are employed.

As the ledges *p″* grasp the heavy ends of the valve there is no danger of springing the comparatively thin shell or spherical portion that contains the seat, because said shell or globe is situated within the recess P, which latter is of relatively greater diameter than is said shell.

In ordinary chucks, where the pressure is

thrown directly upon the thin shell, and not on the thick and unyielding pipe-ends, it frequently happens that the cock is sprung while in the chucks, and as soon as it is removed from the lathe the shell at once assumes an entirely different shape, which defect must be overcome by a subsequent finishing operation.

All these annoyances are completely obviated by the above-described arrangement of deep recess P and grasping-ledges p'', or their equivalent bearings, such as lugs or pins or other projecting members.

A number of balls, X, may be introduced between either of the tables and their appropriate jaws, so as to diminish friction, the balls being adapted to revolve in semicircular annular grooves, as seen in Fig. 10.

The preferred method of applying my chuck to an ordinary turning-lathe, and employing the device in finishing globe-valves or other fittings, is as follows:

The boss *a* is first engaged with the head-stock mandrel, and the head-stock is rotated until jaw H is vertically above said mandrel, as this is the most convenient position for manipulating the device. Socket-wrench Z is then applied to the upper shank e'' of the screw-shaft E F F′, and said shaft is rotated in such a manner as to cause a recession of the two jaws G and H. The chucks O and Q are now engaged with their respective holders or tables L and R, and the valve or cock is placed in its proper position within the lower chuck Q, it being understood that a separate pair of chucks is employed for each distinct size of valve or cock or other fitting to be finished. The reversely-threaded screw F F′ is then properly rotated, so as to close the jaws G H, which act causes the spherical portion of the valve to be surrounded by the recesses P of the two chucks, while their ledges p'' and q' grasp the flat facets at the pipe-ends in such a secure manner as to effectually prevent any rotation or shifting of the valve. When thus properly secured in position, the axis of the cock or other fitting is exactly in line with the lathe-centers, and it is evident the cock can now be finished in the most expeditious manner, and without removing it from the chucks.

Now, presuming that the neck of the valve is presented toward the tail stock of the lathe, the first proceeding will be to bore out the interior of said neck and cut the appropriate valve-seat in the cock.

These two acts are accomplished at a single operation, by simply shifting a "monitor" tool-holder toward the head-stock, thereby causing an appropriate tool to enter the neck and bore out the latter, and immediately thereafter to cut the valve-seat, it being understood that the head-stock, together with box or housing A and its attachments, has first been caused to revolve in the usual manner.

As soon as the valve-seat is cut the monitor-holder is retracted and rotated so as to present a tool for dressing the exterior of the neck, which dressing having been accomplished, another retraction of said holder is effected, and another tool brought to bear for cutting the male thread around said neck.

This presentation of the neck for the action of the appropriate finishing-tools is seen in Figs. 1 and 2. The monitor-holder is then retracted, and the rotation of the head-stock is arrested so as to permit the application of the socket-wrench Z to the now upwardly-projecting shank k'' of spindle K, which wrench is forced as far down down on said shank as may be necessary. By this means the lower end of wrench Z is brought in contact with the slotted portion of lever N, thereby depressing said lever and elevating bolt M, so as to disengage the latter from table L.

The wrench is now employed for rotating spindle K and its attached table L, and, as soon as the latter has been caused to perform one-fourth of a revolution, bolt M instantly flies down into another socket, *l*, and locks said table securely in its new position.

As the several devices K, L, O, Q, R, and S are clamped tightly together, it is evident they all rotate in unison with the upper table L, and, as a result of this simultaneous rotation of said devices, one of the pipe-ends of the cock is now presented toward the tail-stock of the lathe. The monitor-holder being again brought into service, said pipe-end is bored out, and then the customary female thread is cut therein, after which the monitor-holder is retracted.

The rotation of the head-stock is again arrested, the spring-bolt M disengaged from table L, and the latter is then turned around horizontally until the other pipe-end of the cock is brought to a proper position to be operated on by the appropriate tools, when the above-described manipulations of finishing the pipe-ends are repeated, after which the cock is released from the chucks by opening the jaws G H. Another cock is then applied to the open jaws, and subjected to the same consecutive series of operations and manipulations. As the valves are not removed from the chucks until they are finished, it is evident no time is lost in changing the fittings, and, consequently, all dressing operations are effected in the most expeditious, thorough, and uniform manner, the cocks or valves, when finished, being exact fac-similes of each other in every respect.

In this specification, wherever the terms "upper jaw" and "lower jaw" occur they are to be understood as mere relative terms employed for designating the position of said jaws for the time being, as neither of them can be properly termed the upper or lower jaw while the head-stock rotates.

It is evident the position of housing A and its chuck attachments may be exactly reversed with reference to the finishing-tools—

that is to say, such tools may be caused to revolve while the chucks are stationary in the tail-stock of the lathe, and the cock or other fitting is held rigidly in said chucks during the time the tools are operating around the valve. I have described the two jaws G H as capable of advancing and receding simultaneously by means of the compound screw E F F′, but it is evident each jaw may have its individual screw, if preferred. By this arrangement either of the jaws can be adjusted without changing the position of its opposing one.

Finally, the boss *a* may be omitted, and the housing A can be coupled either to the head-stock or tail-stock, in any convenient manner.

I claim as my invention—

1. The combination of housing A, adjustable jaws G H, rotable tables L R, and removable chucks O Q, one of said tables, L, being capable of locking at any desired position, substantially as herein described, and for the purpose set forth.

2. An improved lathe-chuck, consisting of housing A *a* C D, reversely-threaded shaft E F F′, simultaneously but oppositely-adjustable jaws G G′ H H′, rotating tables L R, and detachable chucks O Q, one of said tables, L, being capable of locking at any desired position, substantially as herein described, and for the purpose set forth.

3. The combination of housing A *a* C D, simultaneously-adjustable jaws G G′ H H′, rotating tables K L R S, and locking devices *l* M *m*, or their equivalents, substantially as herein described, and for the purpose set forth.

4. The combination of the pivoted lever N with the pin or bolt M, and the table L with its pintle K, as and for the purpose described.

5. The combination, in the jaws of a lathe-chuck, of the anti-friction bearings *h′* and U, for supporting the respective spindles K and S of rotable tables L and R, substantially as herein described, and for the purpose set forth.

6. In combination with lathe-chuck O and rotable table L, the retaining-screw *y*, as and for the purpose described.

7. The removable chuck O, recessed at P, notched at *p p′*, and provided with ledges or projections *p″*, which ledges are adapted to grasp the pipe-ends of a cock, substantially as herein described, and for the purpose set forth.

8. The removable chuck O, when constructed with a recess, P, notches *p p′*, ledges *p″*, and a dovetail tenon, *o*, which latter engages with the under-cut groove *l′* of the rotable table L, substantially as herein described, and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

JAMES POWELL.

Witnesses:

JAMES H. LAYMAN,

L. H. BOND.