

P. F. KRUG.
CHUCK.

APPLICATION FILED MAY 7, 1898.

NO. MODEL.

3 SHEETS—SHEET 1.

Fig. 4.

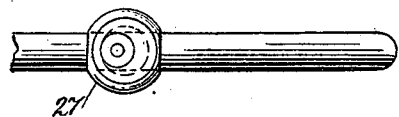


Fig. 1.

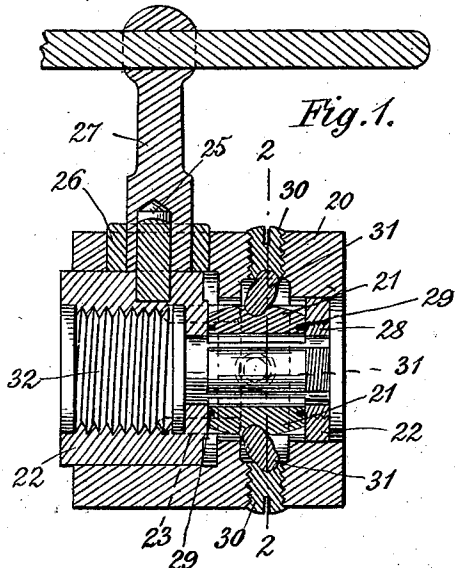


Fig. 2.

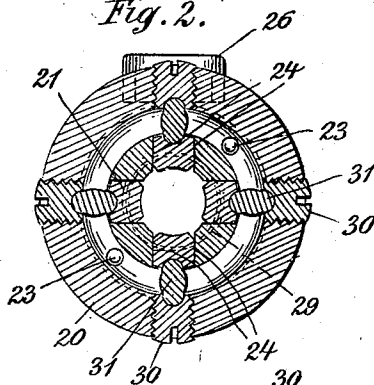


Fig. 3.

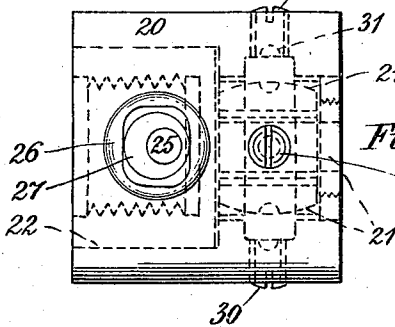


Fig. 5.

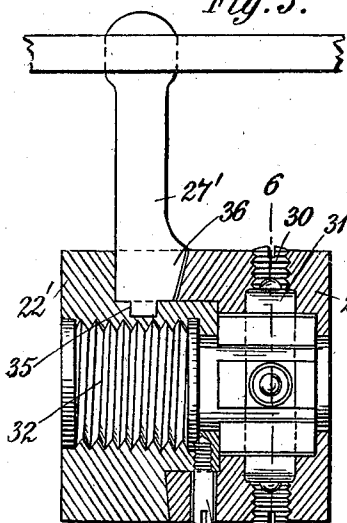


Fig. 6.

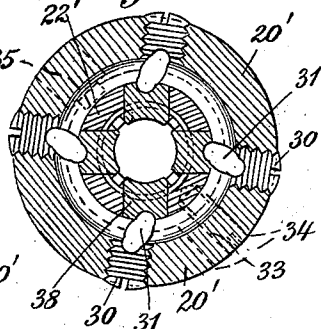


Fig. 7.

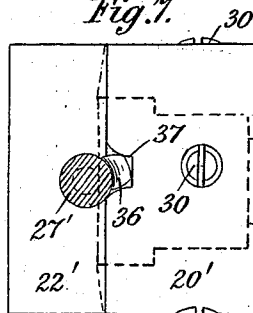


Fig. 9.

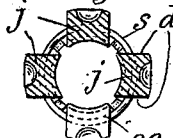
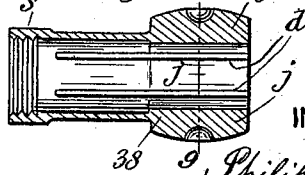


Fig. 8.



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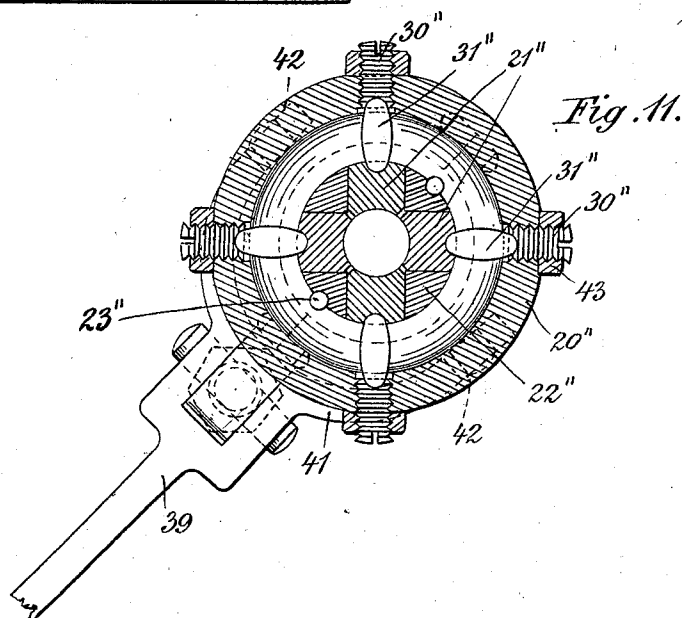
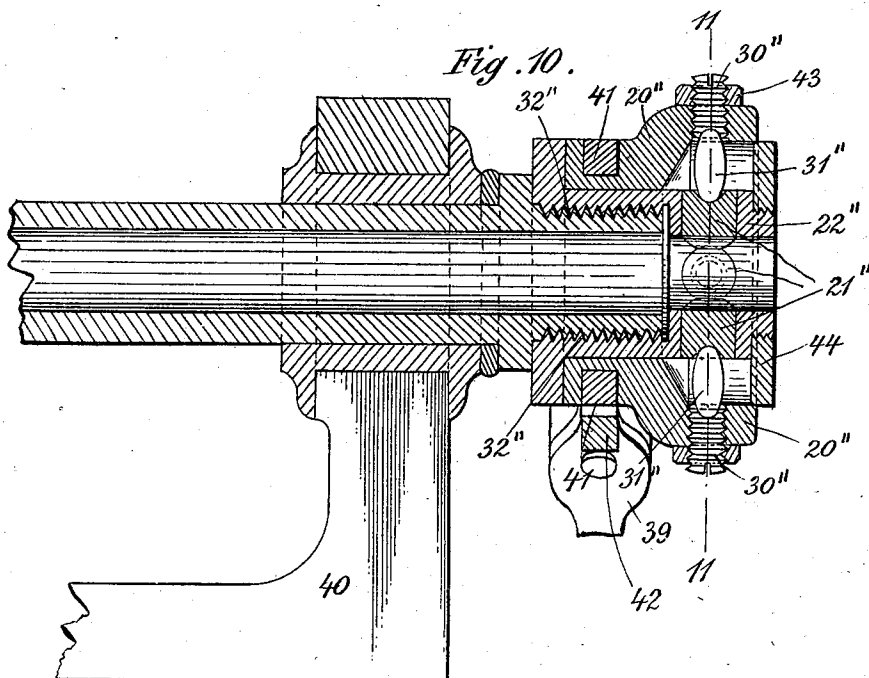
PATENTED APR. 14, 1903.

P. F. KRUG.
CHUCK.

APPLICATION FILED MAY 7, 1898.

NO MODEL

3 SHEETS—SHEET 2.



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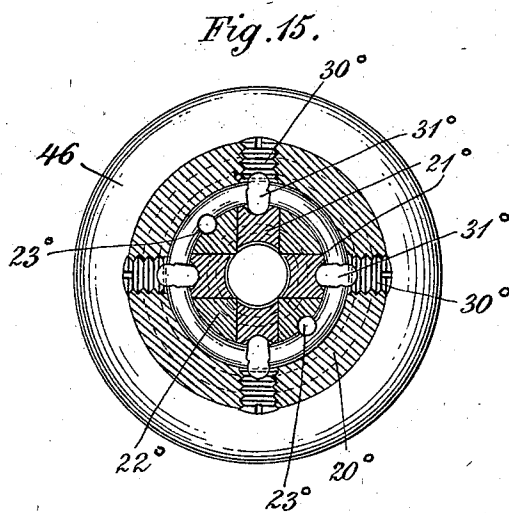
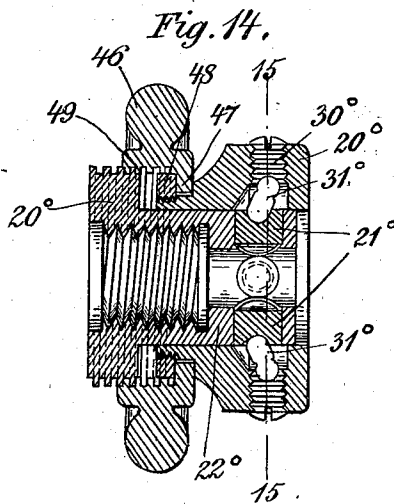
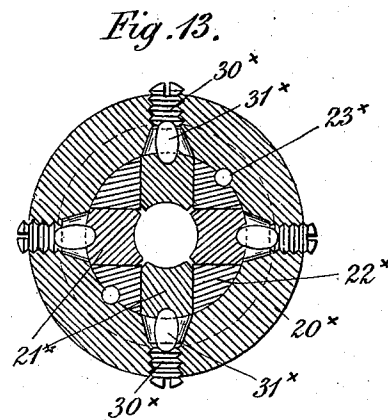
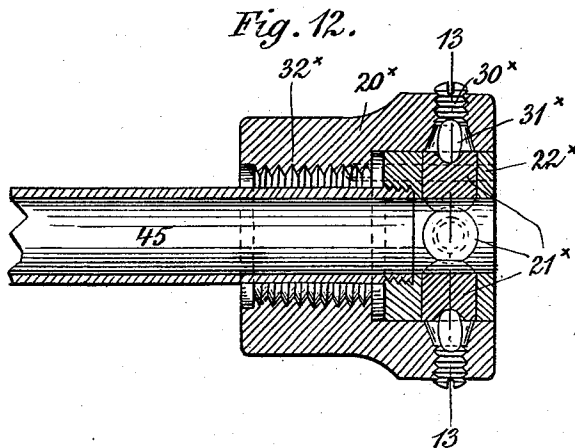
PATENTED APR. 14, 1903.

P. F. KRUG.
CHUCK.

APPLICATION FILED MAY 7, 1898.

NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

PHILIP F. KRUG, OF NEW YORK, N. Y.

CHUCK.

SPECIFICATION forming part of Letters Patent No. 725,346, dated April 14, 1903.

Application filed May 7, 1898. Serial No. 680,016. (No model.)

To all whom it may concern:

Be it known that I, PHILIP F. KRUG, a citizen of the United States, and a resident of the city of New York, county and State of New York, have invented certain new and useful Improvements in Chucks, of which the following is a specification.

My invention relates to chucks such as are used in connection with turning-lathes; but it will be seen from the following specification that the leading features of my invention are also applicable to ordinary stationary gripping-vises and in general to all kinds of chucks.

The objects of my invention are to so construct a chuck that the same may be opened and closed readily and without the use of tools.

Further objects are to provide simple and efficient means for producing a strong, uniform, and prompt gripping action by the jaws of the chuck upon the article to be held thereby, to guard against slack and wear of the jaws and to compensate for the same, and also to construct a split jaw the jaws of which are particularly adapted to be properly guided inward and outward within a proper casing forming part of the chuck.

I accomplish these and other useful objects in the manner and by the means hereinafter described, and set forth more particularly in the claims.

In the accompanying drawings, forming part of this specification, and wherein corresponding characters of reference refer to corresponding parts, Figure 1 is a central longitudinal section of a chuck constructed according to my invention, the jaws being open; Fig. 2, a cross-section along line 2 2 in Fig. 1; Fig. 3, a top view of the chuck, indicating in dotted lines the position of the interior parts when the jaws are closed while Fig. 4 is a ground plan of the key for actuating the chuck, showing its position when the jaws are open. In Figs. 5 to 9, inclusive, another form of my improved chuck is illustrated, Fig. 5 showing a longitudinal section of the chuck-casing without the jaws; Fig. 6, a cross-section along line 6 6 in Fig. 5 with split jaws inserted, the chuck being open; Fig. 7, a top view of Fig. 5; Fig. 8, a longi-

tudinal section of such split jaws, and Fig. 9 a cross-section along line 9 9 in Fig. 8. The chuck illustrated in Figs. 10 and 11 appears applied to a lathe, Fig. 10 being a longitudinal vertical section with the jaws closed, and Fig. 11 a cross-section along line 11 11 in Fig. 10. Fig. 12 is a longitudinal section of another form of my improved chuck, and Fig. 13 a cross-section along line 13 13 in Fig. 12. Fig. 14 shows my improved chuck in longitudinal section and provided with a hand-wheel for operating the same, and Fig 15 a cross-section along line 15 15 in Fig. 14.

Referring first to Figs. 1 to 4, inclusive, 20 represents the casing of a chuck. The same incloses a series of jaws 21 21, usually three or four, which when forced toward each other are adapted to firmly grip and hold an article of proper size inserted between the same. 22 is a second casing adapted to slide within casing 20, pins 23 being inserted in contact with both said casings to prevent their revolving with reference to each other. Jaws 21 are adapted to slide inward and outward within proper channels 24 in casing 22. 25 is a stud on inner casing 22, and 26 a bushing around the same attached to outer casing 20 and having its perforation placed eccentrically with reference to said stud. 27 is a key, circular in cross-section, fitting over said stud and being adapted to so engage with said walls of the bushing as to compel longitudinal movement of stud 25, and with it of casing 22, along casing 20 when said key is being turned one hundred and eighty degrees. 28 is a nut screw-threaded exteriorly, so as to engage with the end of casing 22 for the purpose of confining the jaws longitudinally. 29 represents C-shaped springs placed in proper grooves in the ends of the jaws for the purpose of forcing the same outward when the chuck is to be opened. 30 represents screw-plugs inserted in the walls of casing 20 opposite the central portions of the jaws, and 31 braces provided with ends of semispherical configurations, so inserted in corresponding recesses in said screw-plugs and said jaws that when stud or thorn 25 occupies the position shown in Fig. 3 said braces will occupy radial positions substantially at right angles to the outer surfaces of the jaws, whereby

the jaws will be forced inward, so as to produce gripping action, while when the said thorn occupies the position shown in Fig. 1 said braces will occupy the slanting positions illustrated therein and the jaws 21 will be forced outward by their springs 29, whereby their gripping action will be made to cease. It will be seen that braces 31, in conjunction with casings 20 and jaws 21, form toggle-joints, the action of which is very prompt and positive after their proper adjustment has been obtained by means of screw-plugs 30. The ends of braces 31 where they contact with screw-plugs 30 are made semispherical, as described above, not only for the purpose of permitting the screwing in and out of said screw-plugs without affecting the positions of said braces, but also to avoid binding of the parts while the chuck is being opened and closed. A further important advantage gained by making the ends of braces 31 semispherical instead of semicylindrical, as usually done, consists in the possibility thus offered to let screw-plugs 30 rest directly upon the outer ends of said braces, thus doing away with the necessity of employing an intermediate piece in adjusting said braces by means of said screw-plugs. 32 represents interior screw-thread on casing 22 for attaching the chuck to a lathe.

The construction illustrated in Figs. 5 to 9, inclusive, differs more particularly from the one above described with reference to the means for opening and closing the chuck, the casing 22', which carries the jaws, in this case being revolvably mounted upon casing 20', 33 being a stud inserted in casing 22' and permitted to travel within slot 34 in casing 20', whereby the extreme limit of relative revolution of one casing with reference to the other is fixed and their longitudinal displacement prevented. Key 27' is provided for producing such revolving motion. The same fits into a socket 35 on casing 22' and has a cam 36, constructed like the tooth of a conical wheel, engaging with a proper recess 37 on casing 20'. This form of chuck is particularly adapted to be used in connection with split jaws, as 38, (illustrated in Figs. 8 and 9,) which split jaws are shown here to be provided with the usual tubular shank S and with spring-jaws j, each of which has two parallel sides d, adapted to slide along proper slots in casing 22' as said casing is being revolved with reference to casing 20'. The outer surface of jaws j are recessed, as referred to above, for receiving the ends of braces 31. Said braces form toggle-joints with casing 20' and jaws 38, they rocking in this case, however, in a plane at right angles to the axis of the chuck.

Chucks as illustrated in Figs. 10 and 11 are actuated by a forking lever, as 39, such lever being fulcrumed to the frame 40 of the lathe. 41 is an independent split ring let into a groove on outer casing 20'' and provided with two studs with which the prongs

42 of said lever engage in usual manner, so as to permit of opening and closing the chuck while the lathe is revolving. 43 43 are lock-nuts on screw-plugs 30'', and 44 is a nut on inner casing 22'', serving as an additional guide for casing 20''. Braces 31'' can be made accessible by detaching nut 44. 21'' represents the jaws, 23'' pins for confining the casings in contact with each other, and 31'' braces with semispherical ends inserted between jaws 21'' and screw-plugs 30''.

The chuck illustrated in Figs. 12 and 13 may be opened and closed simply by moving tube 45, which is attached to inner casing 22^x, longitudinally, so as to make said casing slide along outer casing 20^x, which carries screw-plugs 30^x. 21^x represents the jaws, 23^x pins for confining casings 20^x and 22^x in contact with each other, and 31^x braces with semispherical ends inserted between jaws 21^x and screw-plugs 30^x, while 32^x indicates interior screw-thread on casing 20^x.

In the chuck illustrated in Figs. 14 and 15 a hand-wheel 46 is employed to produce relative longitudinal displacement of outer casing 20° and inner casing 22°. For such purpose said wheel is provided with a flange 47, resting against a nut 48, screwed to the exterior surface of casing 20° to guard against its longitudinal displacement and is also provided with interior screw-thread 49, engaging with corresponding screw-thread on the outer surface of casing 22°, whereby when said hand-wheel is being revolved braces 31° will be either brought into the tilting positions shown in Fig. 14 or will be brought into approximately vertical positions corresponding with a closed condition of the chuck. 21° represents the jaws, 23° pins for confining the casings in contact with each other, and 30° screw-plugs bearing against braces 31°.

I do not wish to confine myself to the detail constructions and combinations herein described, as it will readily be seen that the same might be varied without departing from the spirit of my invention.

I claim as new and desire to secure by Letters Patent—

1. In a chuck, the combination with a casing of jaws movable with reference thereto, screw-plugs inserted in the casing, and braces interposed between and held in immediate contact with said screw-plugs and said jaws adapted to form toggle-joints therewith, and provided with contact-surfaces in the form of portions of a sphere.

2. In a chuck, the combination with a casing of screw-plugs inserted in the same, jaws movable with reference to said plugs, and braces interposed between said screw-plugs and said jaws adapted to form toggle-joints therewith and provided with contact-surfaces in the form of portions of a sphere.

3. In a chuck, the combination with a casing of spring-actuated jaws, screw-plugs inserted in the casing and braces interposed between said screw-plugs and said jaws and

adapted to form toggle-joints therewith and provided with contact-surfaces in the form of portions of a sphere.

4. In a chuck, the combination with a casing, of a split jaw comprising a solid shank and jaws having guiding-surfaces adapted to slide along proper guiding-surfaces in the casing, and braces interposed between said casing and said jaws and forming toggle-joints therewith.

5. In a chuck, the combination with a casing, of a split jaw comprising a solid shank and jaws having guiding-surfaces adapted to slide along corresponding guiding-surfaces in the casing, braces interposed between said casing and said jaws and forming toggle-joints therewith, and means for revolving the casing with reference to the jaw.

6. In a chuck, the combination with a casing having suitable interior guiding-surfaces, of a split jaw comprising a solid shank and jaws having parallel guiding-surfaces adapted to slide along the guiding-surfaces in the casing, screw-plugs in the casing, and movable braces between said plugs and said jaws and inserted in suitable depressions in said jaws.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 5th day of May, 1898.

PHILIP F. KRUG.

Witnesses:

CHAS. L. HORACK,
WM. J. PARSONS.