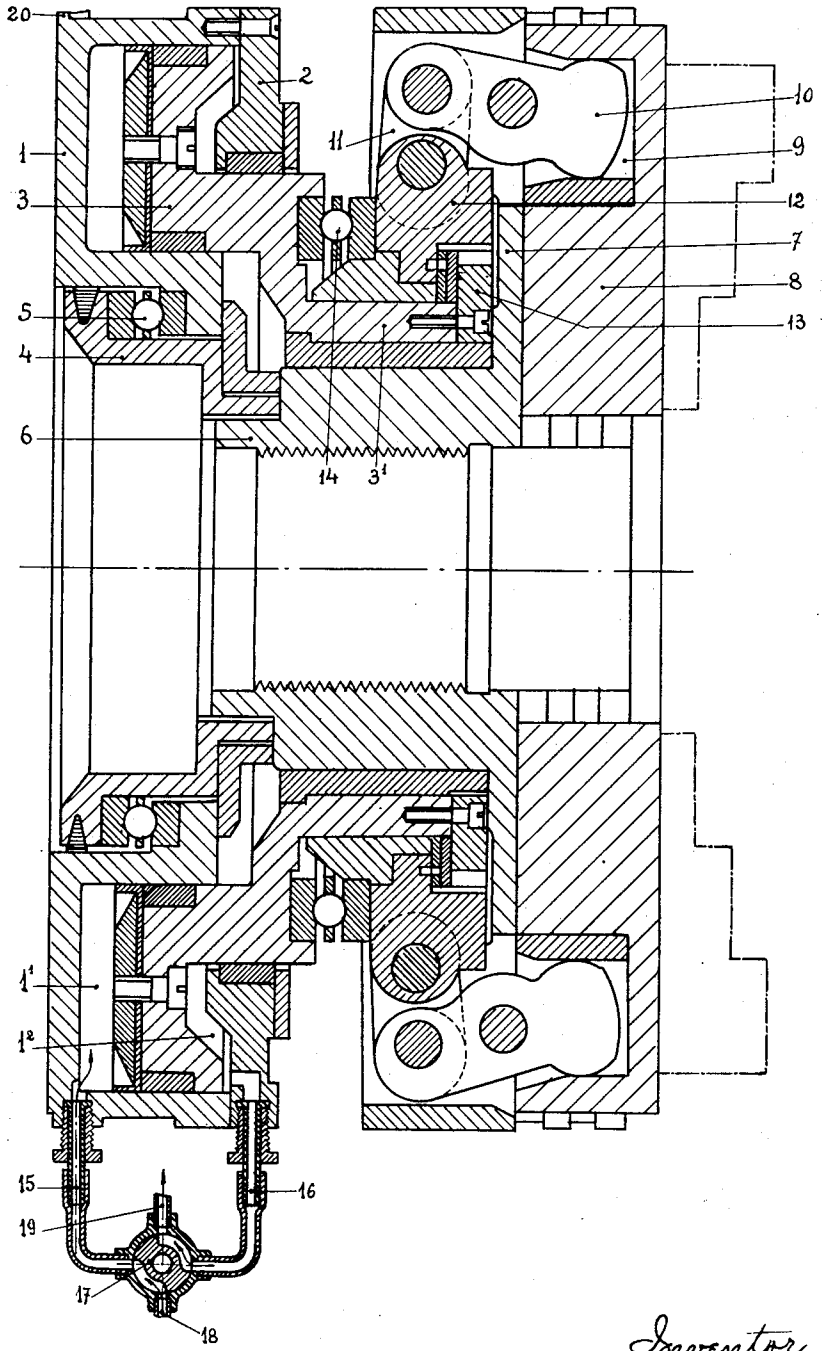
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SELF CENTERING CHUCK

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UNITED STATES PATENT OFFICE.

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SELF-CENTERING CHUCK.

Application filed April 3, 1925, Serial No. 20,485, and in Italy April 9, 1924.

This invention relates to self-centering chucks of the kind having jaws carried by slides arranged to move radially, on a face plate, towards and away from the axis of the chuck.

According to this invention, a self centering jaw chuck is constructed for operation by compressed air or other motive fluid and has its parts so arranged that it can be fitted to a lathe or other machine in place of the ordinary self-centering chuck. The chuck is, or may be, provided with a screw-threaded hub which allows of it being fitted directly on the mandril of the machine.

In one form of the invention, as hereinafter more fully described, an annular cylinder is loosely mounted on the hub of the chuck and contains a piston which transmits its own displacements to a collar provided with radial links which, by means of levers, actuate the jaw-carrying slides. The piston is moved by compressed air or other motive fluid admitted into the cylinder on one or the other side of the piston accordingly as the jaws are to be opened or closed.

This form is illustrated, by way of example, on the accompanying drawing which shows the chuck in section.

On the drawing, 1 indicates an annular cylinder provided with a head 2 and containing a piston 3 which forms two chambers 1^1 and 1^2 within the cylinder.

The cylinder is loosely mounted on a collar 4 carrying a ball thrust bearing 5, said collar being fixed on the hub 6 of the jaw chuck 7 which is adapted to be screw-threaded in the usual way on to the mandril of a lathe or other machine.

Each jaw-carrying slide 8 of the chuck is movable in a radial slot formed in the chuck face and is provided with a recess 9 into which engages one end of a lever 10 pivoted to the face plate of the chuck, the other end of said lever being connected by a radial link 11 with a collar 12 loosely mounted on an extension 3^1 of the piston 3 and connected with the latter axially by means of a shoulder or collar 13 and a ball thrust bearing 14.

The cylinder 1 is provided with a thrust or reaction arm 20 intended to be fixed to any stationary part of the lathe or machine, and with pipes 15, 16 establishing communication between the chambers 1^1, 1^2 and a valve 17 which has a supply pipe 18 for compressed air or other motive fluid and a discharge pipe 19.

When a work-piece is placed between the jaws and the valve 17 is turned to the position shown in the drawing, compressed air or other motive fluid passes from the supply pipe 18 through the pipe 15 into the chamber 1^1 and moves the piston to the left, expelling the air or other fluid from the chamber 1^2 through the pipes 16 and 19. This movement of the piston is transmitted to the collar 12 thereby causing the links 11 to straighten out and rock the levers 10 to produce a radial movement of the jaw-carrying slides 8 towards the axis of the chuck, said jaws then engaging and gripping the work-piece tightly.

When the work-piece is to be removed, the valve 17 is turned so as to place the pipe 15 in communication with the discharge pipe 19 and the pipe 16 in communication with the supply pipe 18. The compressed air or other motive fluid then enters the chamber 1^2 pushing back the piston which expels the air or fluid from the chamber 1^1, through the pipes 15 and 19. This movement of the piston is transmitted to the collar 12 thereby moving the links 11 and rocking the levers 10 to produce a radial movement of the jaw-carrying slides 8 away from the axis of the chuck and consequently away from the work-piece.

Of course, if the work-piece is hollow and is to be gripped from the inside, the jaw-carrying slides will be moved radially outwards in the manner described for the purpose of gripping the work-piece and will be moved radially inwards when the work-piece is to be released.

The valve 17 can be turned to close both pipes 18 and 19 in order to maintain the jaw-carrying slides in any position to which they may have been moved.

The supply and discharge of the compressed air or motive fluid may also be by independent valves, and the constructional details of the chuck including the operating mechanism may be varied from those described.

What I claim is:

1. A chuck comprising a fixed cylindrical member having an annular cylinder, surrounding the same, an annular piston in the cylinder, pneumatic mechanism for axially reciprocating the piston, a hub-member rotatably connected at one end with the cylindrical member, a plurality of radially movable jaw-carrying slides mounted in the

other end of the hub-member, a rotary annular member surrounding the hub between the slides and piston and movable with the latter, and means actuated by the axial movements of the annular member to radially move the slides.

2. A chuck comprising a fixed cylindrical member having an annular cylinder surrounding the same, an annular piston in the cylinder, pneumatic mechanism for axially reciprocating the piston, a collar rotatably mounted in the cylindrical member, a hub-member having one end fixed to the collar, a plurality of radially movable jaw-carrying slides mounted in the other end of the hub-member, said piston having an extended portion surrounding said hub, a rotatable collar surrounding said extended portion, means connecting the extended portion to the collar whereby the latter is moved axially with the piston, and mechanism actuated by the axial movements of the collar to radially move the slides.

3. A chuck comprising a fixed cylindrical member having an annular cylinder surrounding the same, an annular piston in the cylinder having an annular sleeve extending outside the cylinder, pneumatic mechanism for axially reciprocating the piston, a collar rotatably mounted in the cylindrical member, a jaw-chuck having a hub portion journaled in the sleeve and connected to said collar, a plurality of radially movable jaw-carrying slides mounted in the jaw chuck, a ring surrounding the sleeve, means connecting the sleeve and ring adapted to permit rotation of the latter relatively to the sleeve and to move the ring axially with the movements of the piston, levers pivoted in the jaw chuck operatively connected to the slides, and links connecting the levers to the ring adapted to rock the levers to impart radial movement to the slides.

In testimony that I claim the foregoing as my invention, I have signed my name.

GUIDO FORNACA.