June 5, 1934. J. PIRON 1,961,528

UNIVERSAL FACEPLATE FOR MACHINE TOOLS

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Fig 1

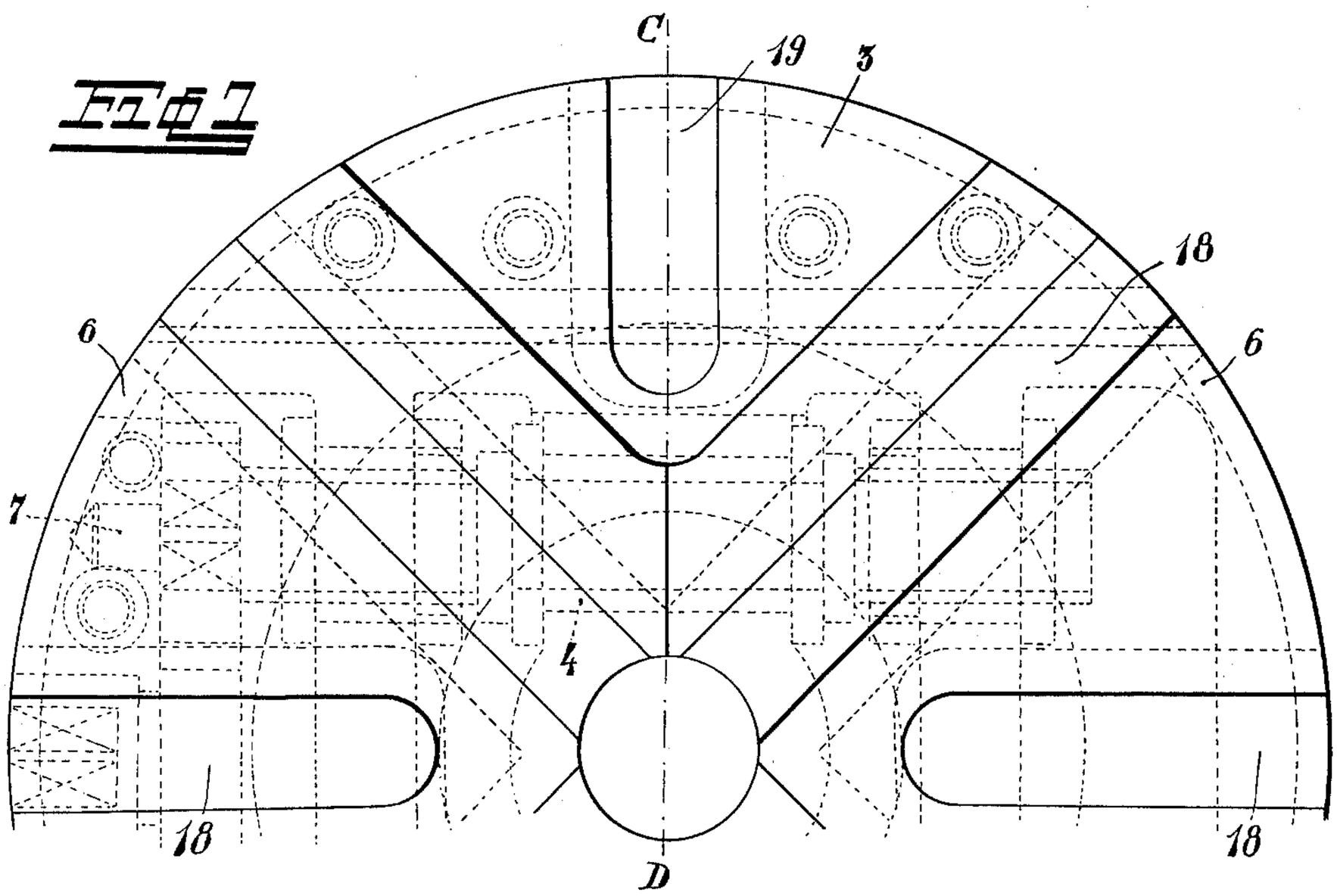

Fig 3

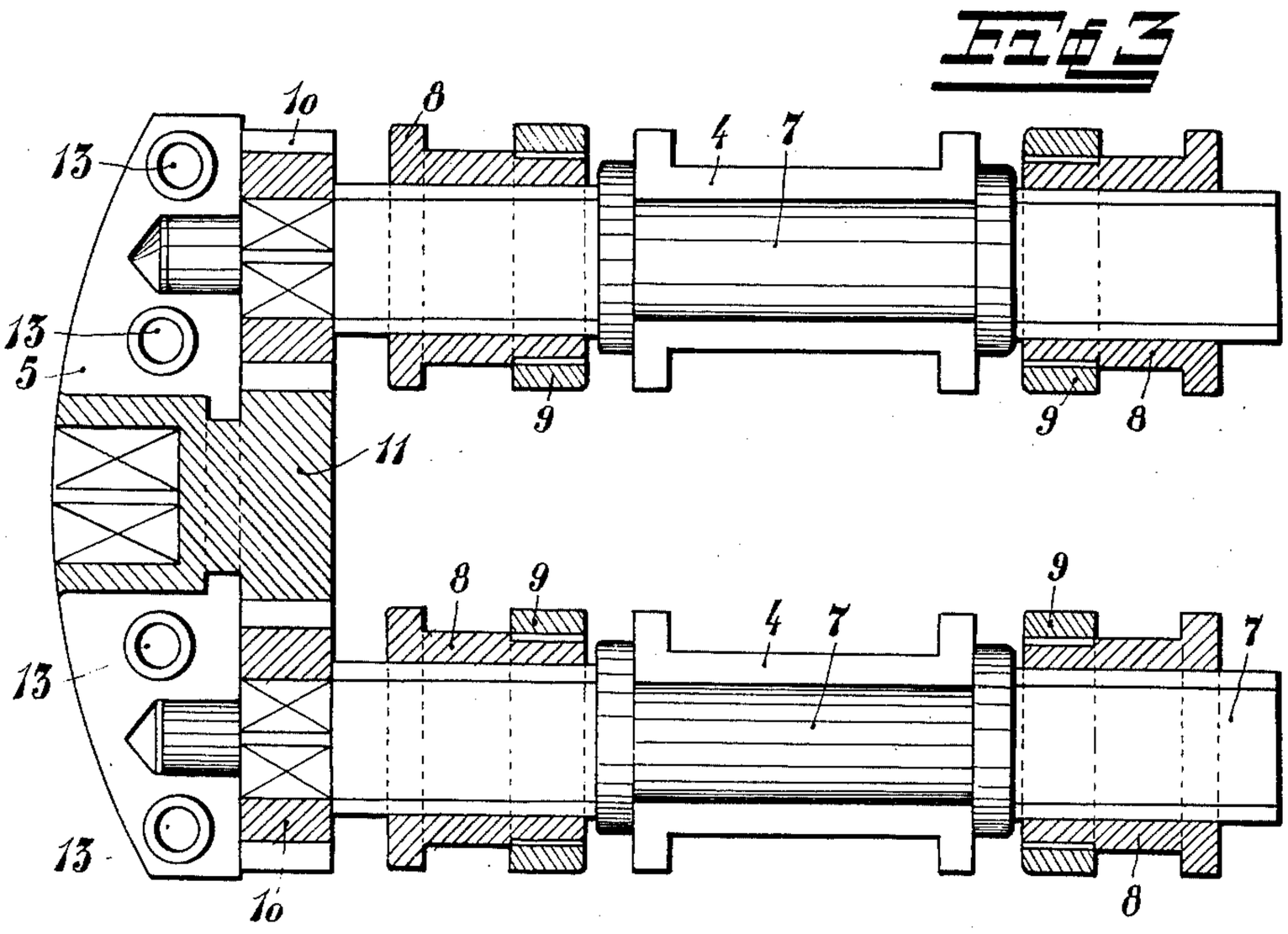

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Fig 2

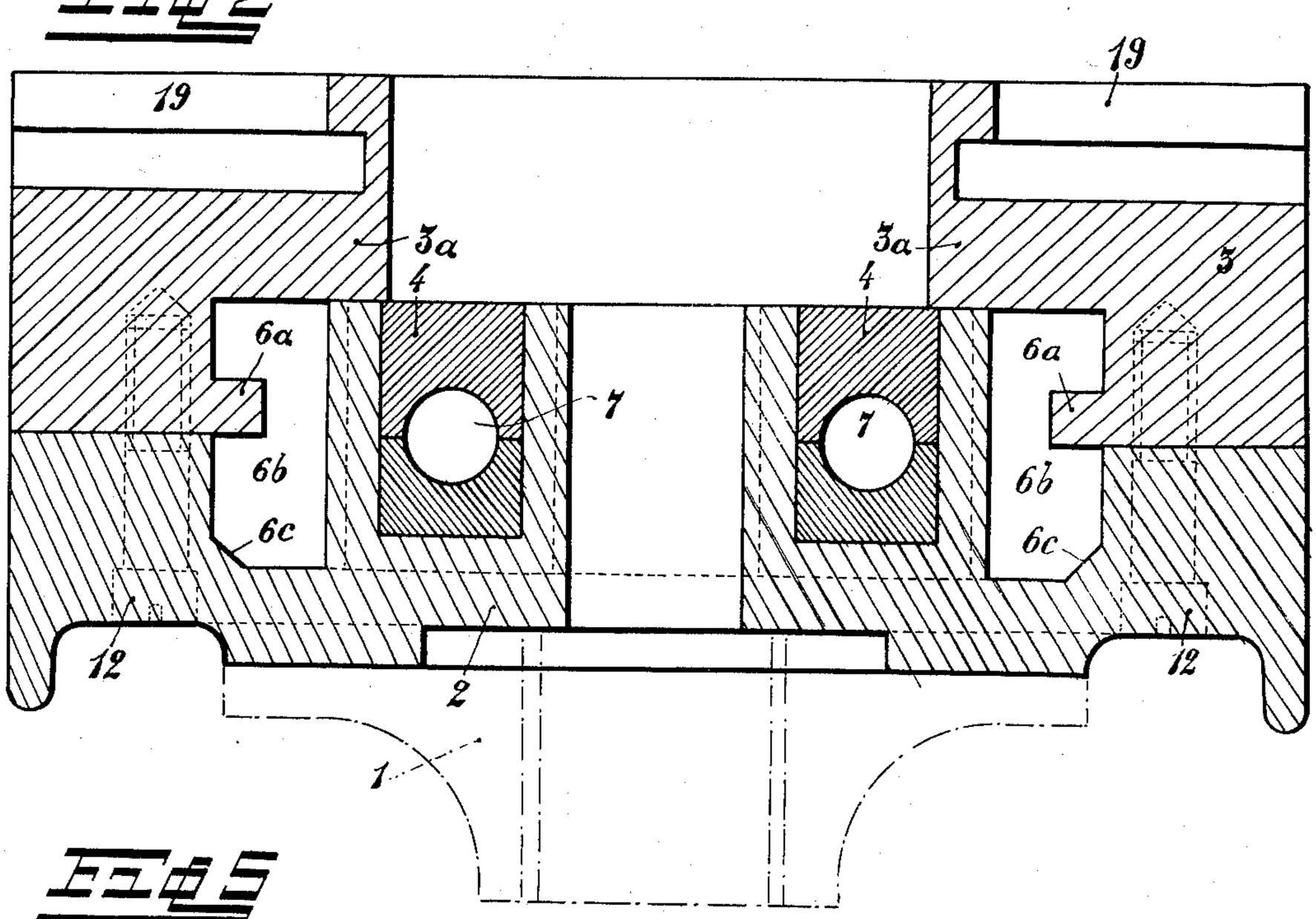

Fig 5

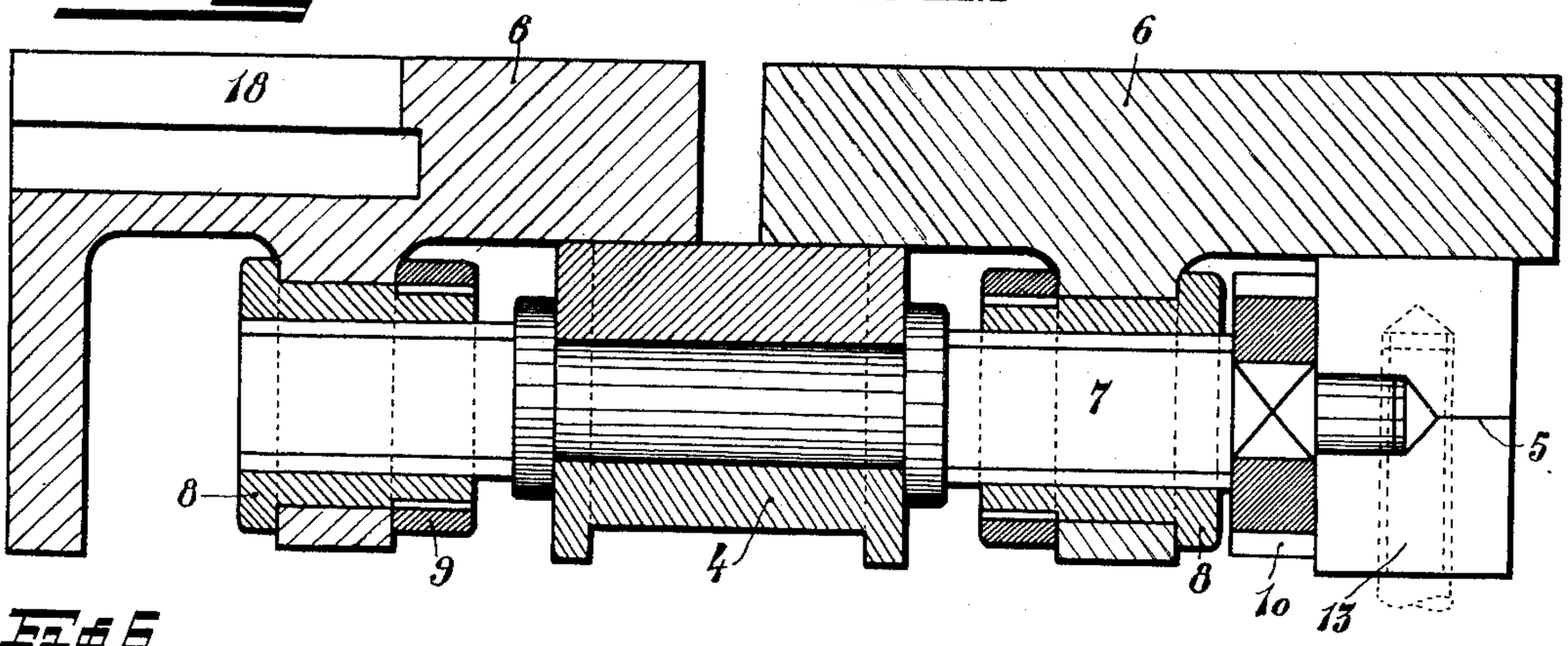

Fig 6

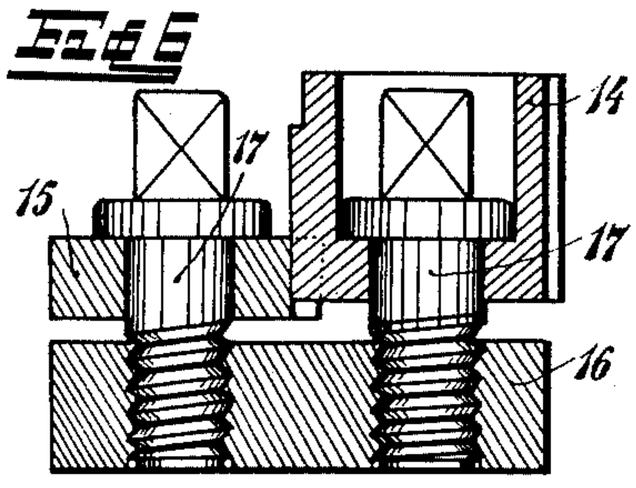

Fig 7

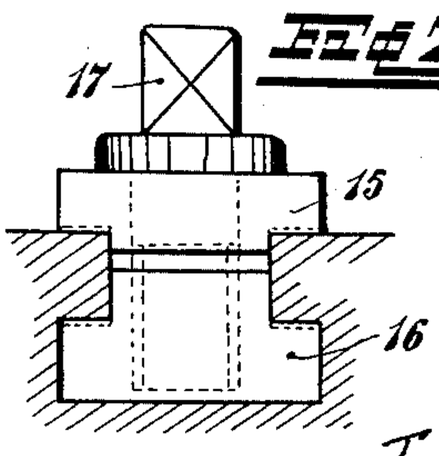

Fig 8

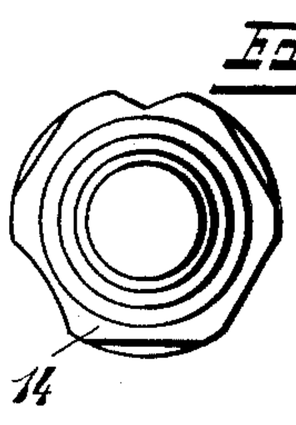

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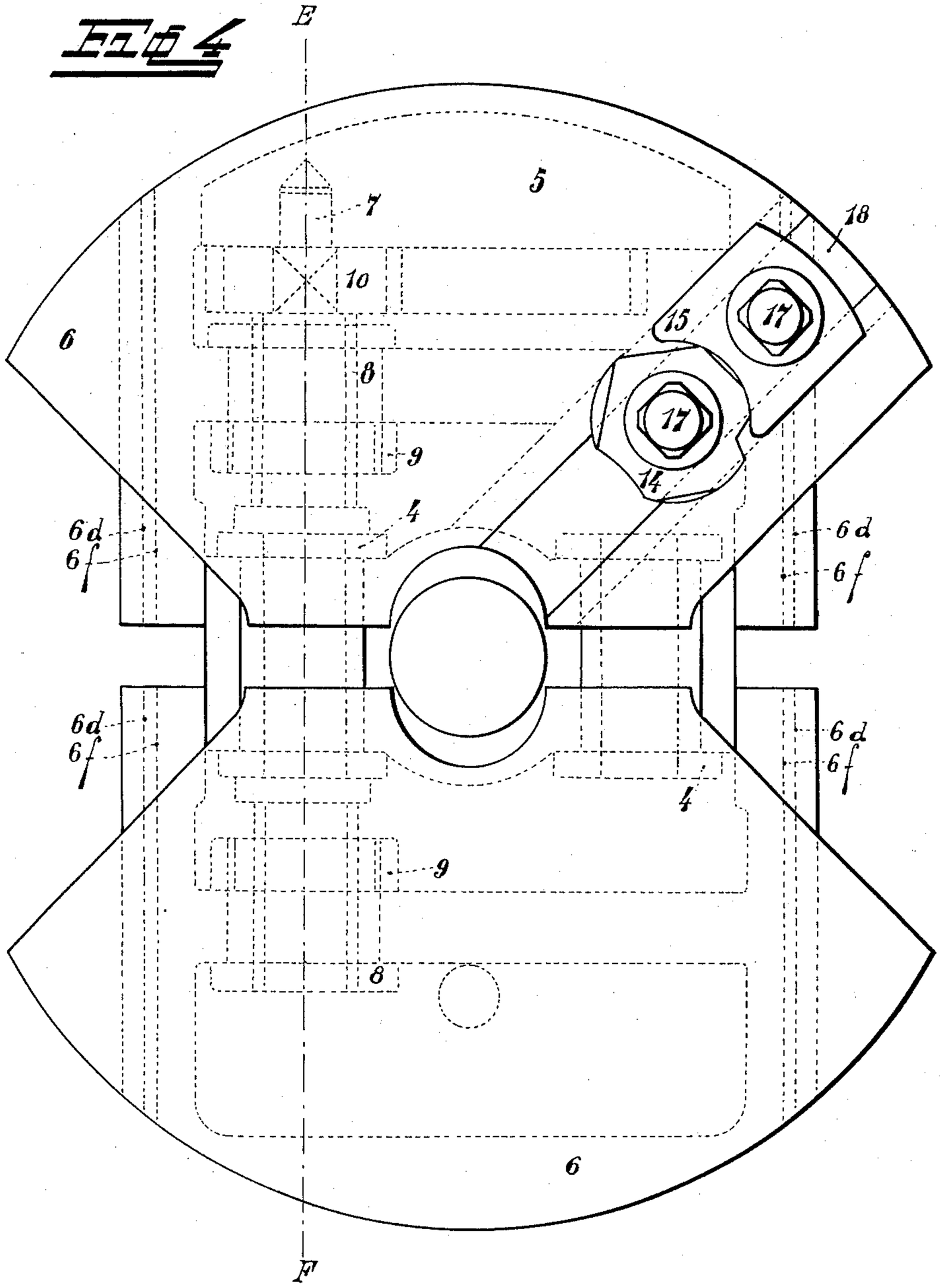
Fig 4



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Patented June 5, 1934 1,961,528

UNITED STATES PATENT OFFICE

1,961,528

UNIVERSAL FACEPLATE FOR MACHINE TOOLS

Joseph Piron, Brussels, Belgium

Application December 22, 1932, Serial No. 648,485
In Belgium January 15, 1932

4 Claims. (Cl. 82—40)

The present invention relates to a universal face-plate for machine tools. This face-plate possesses movable parts having the shape of plate sections (quarters) provided with grooves for receiving the fixation jaws of the piece to be machined.

These movable plate-sections can slide towards or away from the centre in order to realize the clasping or the unclasping by a simple rotating movement which is given from the exterior by means of pinions driving two threaded-rods of opposite thread on which are engaged screws fixed at the movable plate-sections.

One face-plate of this kind has been described in my previous U. S. Patent No. 1,481,301.

One subject of the present invention is to allow the easy dismounting of the face-plate for verification and maintenance purposes without modifying in any manner the regulation of the said face-plate.

Another subject of the present invention is to insure a perfect guiding of the movable plate sections in the fixed part of the plate and to prevent any raise motion from the bottom towards the top and any lateral motion of the movable plate-sections with respect to the plate.

Another subject of my present invention is a special device of jaw of easy realization and construction allowing to the practitioner of the face-plate to construct at will jaws made of smooth metal and appropriated to the different forms of pieces to be machined.

The annexed drawings show, by way of example, one embodiment of the invention.

Figure 1 is a partial plan view of the face-plate without the jaws, the solid lines indicate the delimitation between the two movable plate-sections. In the middle of the device is seen in dotted lines the interior movement more completely shown in Figure 3.

Figure 2 is a section view of the face-plate on the line C—D of Figure 1 at the point of contact between the two movable plate sections.

Figure 3 represents the complete interior movement, the upper parts of the face-plate and the bushes being removed.

Figure 4 shows the plan view of the two movable plate-sections for an unclasped position of the face-plate, that is to say for a position corresponding to the simultaneous removal from the centre of the plate, of the two movable plate sections.

Figure 5 is a section view on the line E—F of Figure 4, on the longitudinal axis of one of the threaded-rods.

Figure 6 is a sectional view of the rotating jaw and the counter jaw.

Figure 7 is an elevational view showing the manner of locking the counter jaw, and

Figure 8 is a plan view of the rotating jaw.

A plate 2 which directly supports the whole movement of the face-plate is directly fixed on the nose of the machine tools; in certain cases and properly when using the face-plate according to the invention in a lathe machine or a rectifying machine, the fixation of the face-plate is made by means of a counter plate 1 represented in dot and dash lines in Figure 2.

On the plate 2 are positioned plate-sections 3 maintained by means of screws 12. These plate-sections are provided with a rib 6*a* directed parallel to the threaded-rods 7; they form with the plate 2 guiding-grooves 6*b* (Fig. 2) for movable plate-sections 6. The two guiding grooves 6*b* are respectively provided with faces 6*c* inclined in contrary direction and on which are supported corresponding inclined faces 6*d* on the movable plate-sections. The guiding-rib 6*a* of the fixed plates is engaged into corresponding grooves 6*f* of the movable plate-sections 6. These ribs 6*a* and grooves 6*f* which extend on the whole length of the plate-face, are intended to prevent any raise of the movable plate-sections 6 and to maintain in contact the inclined faces 6*c* and 6*d* which respectively belong to the plate 2 and to the movable plate-sections 6. These inclined faces prevent any lateral motion of the movable plate-sections with respect to the plate.

As visible in Figure 2, the fixed plate-sections 3 extend by their beak 3*a* against the hollow ring of the bushes 4 in order to constitute a supplementary guiding for the movable plate-sections.

The central parts of the two threaded-rods 7 are enclosed by means of a bush 4 in two parts preventing any longitudinal motion of these rods, but allowing their rotation on themselves. The central pinion 11 rigid with the square of clasping disposed towards the periphery of the device meshes with two straight pinions 10 placed on one and another part of the central pinion 11; these straight pinions being keyed each on the corresponding threaded-rods 7.

It is clear that a rotation communicated to the central pinion 11 from the exterior of the device determinates the rotation in the same direction of the two threaded-rods 7; these two threaded-rods are provided with a straight thread on the side of the pinions and of a lift thread on the opposite side of these pinions. On these threaded rods are placed screws 8 having an appropriate

thread so that, according to the direction of rotation of the rods 7, they simultaneously approach or go away from the centre of the device.

These screws 8 carry with them in their motion the movable plate-sections with which they are connected. For this purpose, each movable plate-section 6 is provided with a rib which goes through it perpendicularly to the axis of the threaded-rods 7; in these ribs are two holes in which the screws 8 are pushed until their abutment. A ring 9 threaded on the exterior diameter of the screws 8 is used for realizing a firm fixation of the screws to the movable plate-sections 6. These movable plate-sections are consequently joined with the screws 8 and follow them in their alternative motion along the rods 7.

On the exterior walls of each movable plate-section 6 three grooves 13 having a T-shape are provided; on the exterior side of each fixed plate-section 3 a similar groove of T-shape is provided; these T-shape grooves are to receive the jaws.

In each of these grooves is disposed a sliding-block 16 which is freely slidable; this sliding block is provided with two threaded holes to receive the screws 17 of the rotating-jaw and of the counter-jaw 15. The rotating-jaw is counter sunk in order to receive the head of the screws 17 and is provided with grooves appropriate to the pieces to be machined. The counter-jaw 15 strengthens the rotating-jaw because it surrounds half the circumference of this latter. The screws with large head have a square for the clasping key.

Each jaw is independent and can be fixed at any place in its groove. The sides of the sliding-blocks 16 of the jaws 14 and of the counter-jaws 15 which are in direct contact with the tongue of the T-shaped grooves are knurled in order to prevent any slide.

In order to fix the jaws on the device, it is sufficient to block the screws 17. They operate the jaws and the sliding-blocks in opposite sides and thus confine between them the projecting tongue of the T-shaped grooves.

The face-plate can also be provided with eight jaws, three for each movable plate-section and one for each fixed plate-section. All these jaws are independent and are regulated according to the shapes of the pieces to be machined. A stroke of key is sufficient on the square of the screws 17 to insure a rapid and definitive fixation of the piece to be machined whatever its shape may be.

After working of this piece, it is sufficient to put away the movable plate-sections by the rotation of the central pinion 11 which is actuated from the exterior of the face-plate; at this moment the distance between these movable plate-sections allows to take up the piece without touching to the jaws and to clasp again a new piece like the former one by a simple rotation of the pinion 11. In this manner the new piece to be machined is exactly mounted at the same place as the precedent piece. By this fact, in the case of a series of pieces having a same shape, the regulation of the jaws is made only once when placing the first piece. This regulation must not be repeated for the working of the next pieces.

In order to realize a part dismounting of the face-plate for verification or maintenance, it is sufficient to withdraw the screws 12 which fix the fixed plate-sections 3 on the plate 2. When the fixed plate-sections 3 are removed, it is possible to withdraw in one block the movable plate-sections, the upper part of the bushes 4, the screws 8 and also the threaded-rods 7. In this manner, it is possible to reach the interior mechanism difficulty.

The face-plate according to the invention offers the following advantages:

1. It permits fixing pieces having any shape;

2. It can be used advantageously on the different kinds of lathes but also on milling and rectifying machines and in general on all machine tools;

3. It permits fixing any piece without key and without bolt;

4. It can take care of special mountings (tongs and chucks) very simply and consequently at little cost and appropriate to the different kinds of pieces to be machined;

5. The simple structure of the jaws permits constructing them without special tools and offers to the practitioner the possibility to realize at will smooth jaws provided with grooves appropriate to the different kinds of pieces to be machined;

6. For machining a large number of pieces having a certain shape, it insures rapidity of mounting and an exact centering permitting different operations of machining without displacing the tool;

7. It advantageously replaces the different patterns of chucks and plates in current use and it allows work on center-lathes;

8. Its clasping is realized by means of a direct driving preventing thus any play, which would be produced into the different intermediate organs of an indirect driving.

What I claim is:

1. A universal face-plate for machine tools comprising a plate adapted to be secured upon the machine spindle, movable plate sections mounted upon said plate, displaceable means upon said movable plate sections to maintain the piece to be machined, screw threaded rods mounted between the said plate and the movable plate sections, said screw threaded rods extending parallel in a direction perpendicular to the axis of the spindle of the machine, screws on the interior side of the movable plate-sections and engaged on the said threaded rods, grooves provided in the said plate and parallel to the said threaded rods, bushes in two parts disposed in said grooves, abutments provided at the extremity of said bushes, in order to prevent their displacement in the longitudinal direction of the threaded rods, said bushes receiving the said threaded rods, and epaulements upon the threaded rods in order to prevent the longitudinal displacement of the said threaded rods in the bushes.

2. A universal face-plate for machine tools comprising a plate adapted to be secured upon the machine spindle, movable plate sections mounted upon said plate, displaceable means upon said movable plate sections to maintain the piece to be machined, screw threaded rods mounted between the said plate and the movable plate sections, said screw threaded rods extending parallel in a direction perpendicular to the axis of the spindle of the machine, screws on the interior side of the movable plate-sections and engaged on the said threaded rods, means for maintaining the threaded rods on the said plate and permitting their rotation, faces inclined in opposite direction on the said plate, correspondingly inclined faces on the movable plate sections cooperating with said first mentioned inclined faces, means for maintaining these inclined faces respectively in contact but per-

mitting the displacement of the movable plate sections in the direction of the threaded rods.

3. A universal face-plate for machine tools comprising a plate adapted to be secured upon the machine spindle, movable plate sections mounted upon said plate, displaceable means upon said movable plate sections to maintain the piece to be machined, screw threaded rods mounted between the said plate and the movable plate sections, said screw threaded rods extending parallel in a direction perpendicular to the axis of the spindle of the machine, screws on the interior side of the movable plate-sections and engaged on the said threaded rods; means for maintaining the threaded rods on the said plate and permitting their rotation, faces inclined in opposite direction on the said plate, corresponding inclined faces on the movable plate sections cooperating with said first named inclined faces, guiding grooves in the movable plate sections in the direction of the threaded rods, corresponding ribs in the fixed plate sections, removable means said fixed plate sections being maintained on the plate by means of said removable means acting to maintain the said inclined faces in respective contact.

4. A universal face-plate for machine tools comprising a plate adapted to be secured upon the machine spindle, movable plate sections mounted upon said plate, means for simultaneously displacing said movable plate sections towards and away from the centre of the plate, T-shaped grooves radially positioned on the surface of the movable plate-sections, T-shaped sliding blocks sliding into said grooves, a screw hole in each of said sliding blocks for receiving a threaded screw crossing the groove, a jaw engaged under the head of the screw to be applied on the surface of the plate when clasping the said screw, and faces of different shapes on the exterior surface of said jaw.

JOSEPH PIRON.