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TOOL SETTING DEVICE FOR MACHINE TOOLS

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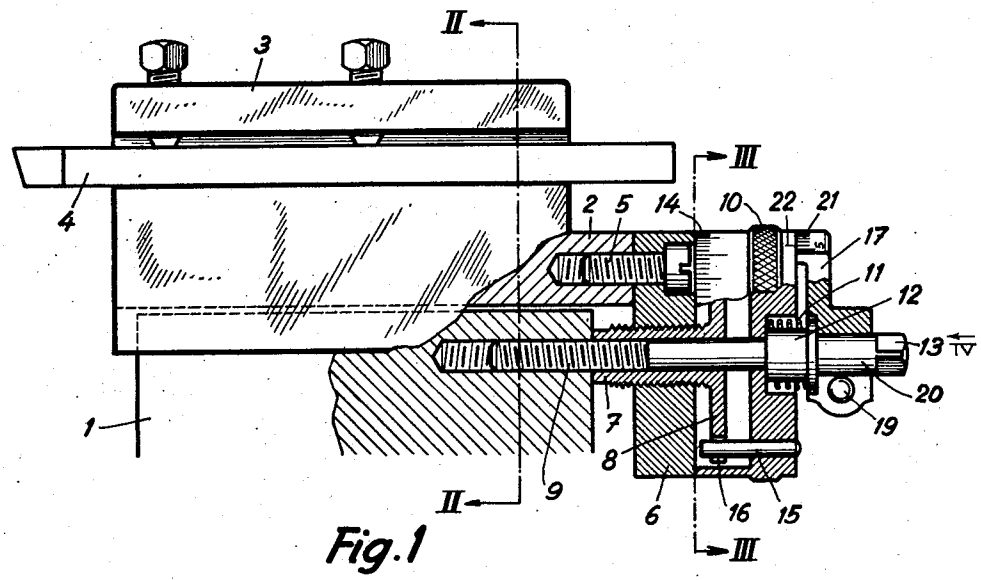


Fig. 1

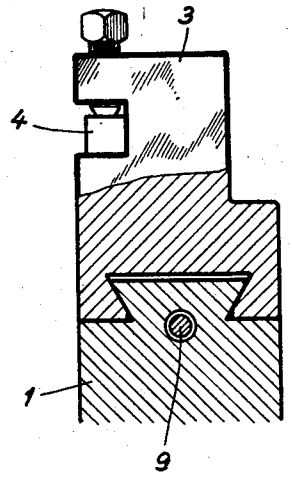


Fig. 2

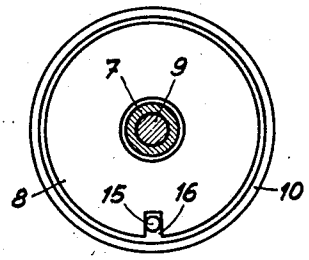


Fig. 3

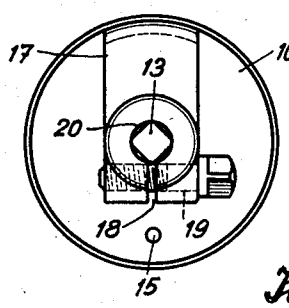


Fig. 4

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TOOL SETTING DEVICE FOR MACHINE TOOLS

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In Switzerland February 18, 1950

1 Claim. (Cl. 82—24)

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This invention relates to machine tools and more especially to tool-adjusting devices serving for setting a tool such as for instance the cutter of a lathe for high precision work.

The invention is an improvement on the tool-adjusting device designed by the applicant and described years ago in a Swiss Patent No. 237,821.

In that device the two screws, a push screw and a pull screw, usually provided in the tool-box and cooperating in the high precision adjustment of the tool for particularly low tolerances, are mounted coaxially, the push screw serving for approaching the tool to the turning axis, while the pull screw is designed to lock the tool in the position for which it had thus been set, one of the screws extending throughout the length of the other (hollow) screw.

According to this invention, now, this adjusting device is improved in that the two cooperating screws are provided with opposite threads, one being formed with right-handed, the other with left-handed thread. It is clear that if the pitch of the two screws is the same, any displacement of the tool in a wrong direction or away from the absolutely accurate setting will be compensated and made good for by the counter-action of the other screw, the opposite threading producing the desired differential effect. The micrometric devices associated as usual with one of the screws then indicate the pressure at which the pull screw bears against the part of the machine carrying the tool-box and enable the operator to adjust the position of the tool with an accuracy which takes account of the most minute displacements in the order of some thousandths of a millimeter which may be caused by the locking operation following the adjustment of the tool-box.

In a preferred embodiment of the invention, the inner screw carries an index plate provided with graduations moving past a mark provided on an index disc or head supported on the outer screw. Said index plate, graduations and marking will then constitute said control means.

The annexed drawings represent, by way of example, one embodiment of the device according to the invention.

Fig. 1 is a side view of the device, partly in section along a plane containing the axis of the two screws.

Fig. 2 is a cross-section along line II—II of Fig. 1.

Fig. 3 is a cross-section along line III—III of Fig. 1, and

Fig. 4 is an elevation viewed in the direction of the arrow IV of Fig. 1.

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In the drawings, the bed of a lathe is indicated by 1, the slide of the tool box at 2, the tool box proper at 3 and the tool at 4. A plate 6 is fixed in the usual manner by means of screws 5 to the four portions of the slide 2 and is traversed by two tool-setting screws. One of these screws, indicated at 7, is screwed into a threaded hole of plate 6 and carries at its outer end a disc 8. It is pierced over its whole length by a bore traversed by the other screw which is indicated at 9 and screwed into the casing or bed of the lathe. The screw 9 traverses furthermore an index disc or head 10 and has a neck 12 between which and the index disc 10 a coil spring 11 is arranged. The outer end of the screw 9 is formed with a square head 13.

The index disc 10 surrounds the disc 8 of screw 7 and bears with a peripherical front surface onto plate 6. Its graduations are indicated at 14. A pin 15 rigidly fixed to it engages a slot 16 of disc 8 to permit rotating screw 7 by means of the index disc 10.

The above described device is disclosed in the aforementioned Swiss patent specification. The novel features and arrangements of the device of the invention consist in making one of these screws 7 and 9, for example the screw 9, a right-handed screw, and the other one, here the screw 7, a left-handed screw, both screws having the same pitch, and in providing on one of said screws means for controlling the pressure with which the pull screw bears onto that portion of the casing or bed 1 which carries the tool box slide 2. In the example which is represented in the drawings, said means are constituted by an index plate 17 slotted at 18 and clamped on a cylindrical portion 20 of the interior screw 9 by means of a screw 19, said cylindrical portion being located between the neck 12 and the square head 13, this index plate having graduations 21 moving beside a marking or index 22 provided on the periphery of the index disc 10.

To adjust or set the position of the cutting edge of the tool by means of the screw 7, which is the pull screw in the example represented, one has first to unlock the screw 9 and then to rotate the screw 7. During such a rotation of screw 7, the relative position of the screws 7 and 9 remains unchanged. As the two screws have the same pitch, one of them being however made with a left-handed thread and the other one with a right-handed thread, the screw 9 has only to be unlocked prior to the setting or adjusting operation without need of further rotation thereof as had to be made hitherto. The rela-

tive position of the two screws 7 and 9 or of the index plate 17 and index disc 18 or of the graduations 21 and the markings 22, indicates independently of the position of the index disc 18 and therefore of the position of the tool box slide 2 with regard to bed 1, whether the pull screw 7 bears upon the bed portion carrying the slide 2, and if so, with what pressure this screw bears on said casing portion. The operator may therefore read on the graduations 21 the very slight displacement of the tool 4 which is caused by the locking of the tool box 2.

I wish it to be understood that I do not desire to be limited to the details of design shown in the drawings and described in the specification for obvious modifications will occur to a person skilled in the art.

What I claim is:

In combination, a bed member, a slide member, said members having overlapping portions, aligned screw threaded bores in said overlapping portions, the threads of one bore being of opposite hand to the threads of the other bore, coaxial bolts of the same pitch, one bolt being threaded into one of said members and bearing against the other member, the other bolt being threaded into said other member and extending beyond the first bolt, spring means operatively positioned between said bolts acting under the influence of said bolts to maintain said one bolt in engagement with said other member whereby simultaneous rotary movement of said bolts will adjust said slide member under equal spring pressure and movement of said bolts in opposite directions will vary the spring pressure and, due to said opposite threaded bores, the extent of opposite movement is a direct indication of the variation of said pressure, and adjacent radial indicators nonrotatably secured to said bolts for recording the degree of opposite movement and therefor the degree of pressure change.

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REFERENCES CITED

The following references are of record in the file of this patent:

FOREIGN PATENTS

Number	Country	Date
237,821	Switzerland	Sept. 1, 1945