

Nov. 13, 1956

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2,770,141

TURN-TABLE TRANSFER MECHANISM

Filed June 16, 1954

2 Sheets-Sheet 2

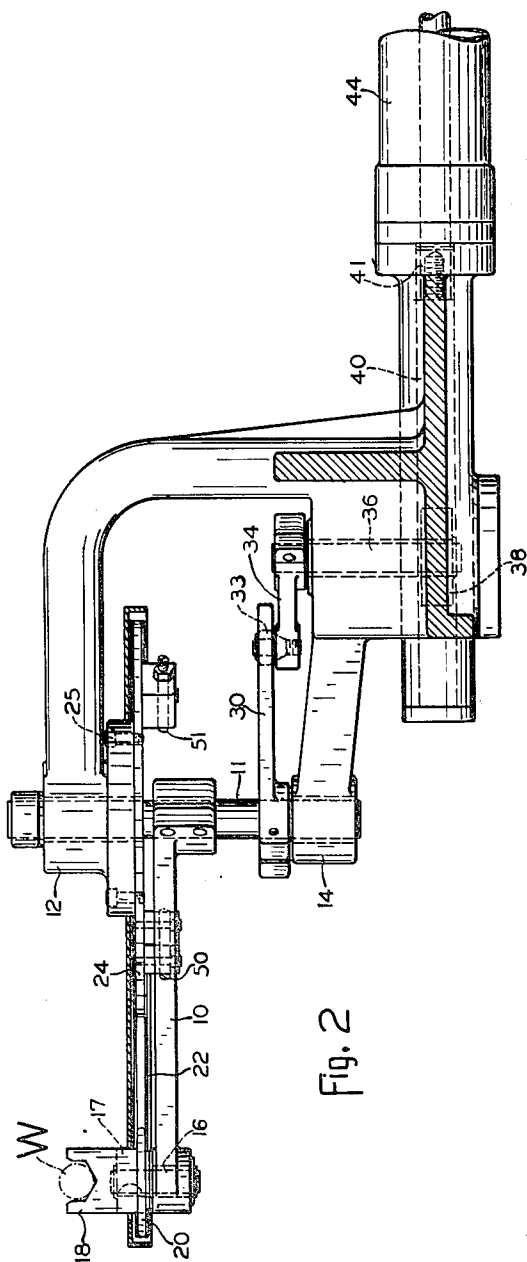


Fig. 2

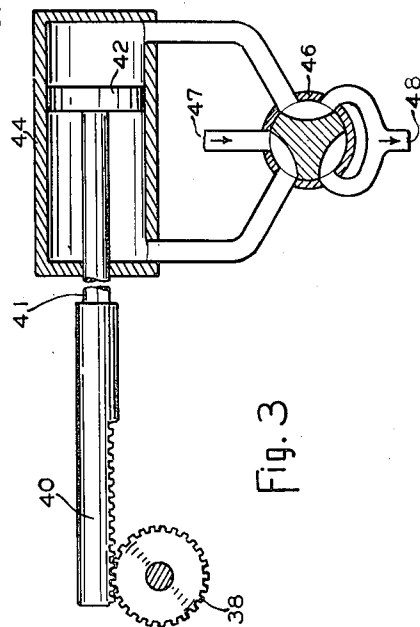


Fig. 3

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TURN-TABLE TRANSFER MECHANISM

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Application June 16, 1954, Serial No. 437,193

1 Claim. (Cl. 74—99)

This invention relates to mechanism for transferring an elongated workpiece from one machine tool to an adjacent machine tool and for automatically turning the workpiece end-for-end during the transfer movement.

In the preferred embodiment, the work is transferred by a horizontally-swinging arm and is turned 180° about a vertical axis in said arm during the swinging movement.

It is the general object of the invention to provide extremely simple and reliable mechanism to accomplish the above-described movements. As shown herein, the entire transfer and turning operation is actuated and accomplished by a single air-operated cylinder and piston.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a plan view of the improved transfer mechanism;

Fig. 2 is a side elevation thereof;

Fig. 3 is a diagrammatic sectional plan view showing certain control connections for compressed air operation; and

Fig. 4 is a detail sectional elevation, taken along the line 4—4 in Fig. 1.

Referring to the drawings, I have shown an arm 10 secured to an upright shaft 11 rotatably mounted in fixed upper and lower bearings 12 and 14 (Fig. 2). An upright shaft 16 is rotatably mounted in the outer end of the swinging arm 10 and supports an elongated cross arm 17 having upright work-receiving members or forks 18 at the opposite ends thereof and spaced to receive and support a piece of work W.

A sprocket 20 (Fig. 1) is secured to the shaft 16 and arm 17 and is connected by a chain 22 to a large sprocket 24 which is mounted in fixed position concentric with the upright shaft 11 and which is held from rotation by clamping screws 25 (Fig. 2).

An arm 30 (Fig. 1) is also secured to the shaft 11 and is provided with an elongated slot 32 to receive a roll 33 mounted at the end of a swinging arm 34. The arm 34 is fixed to the upper end of a short vertical shaft 36 which is rotatable in a fixed bearing and which is provided with a gear 38 at its lower end.

The gear 38 is engaged by a rack bar 40 (Figs. 1 and 3) connected by a rod 41 to a piston 42 slidable in a cylinder

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44. The opposite ends of the cylinder 44 may be alternately and reversely connected through a valve 46 to an air supply pipe 47 or to an exhaust pipe 48.

By shifting the valve 46, the ends of the cylinder 44 may be reversely connected to the supply pipe 47 and to the exhaust pipe 48 as desired. When the valve 46 is shifted, the rack bar 40 will be moved longitudinally to partially rotate the gear 38 and to correspondingly move the arm 34, cam roll 33 and slotted arm 30 to swing the main supporting arm 10 from one extreme to the other of its operative range of movement.

Adjustable stop pins 50 (Fig. 4) and 51 (Fig. 1) engage the sides of the arms 10 and determine the limiting positions of the arm.

The parts are so proportioned that a swinging movement of the cam roll arm 34 of approximately 90° will swing the arm 10 from engagement with the stop 50 to engagement with the stop 51 or vice-versa.

During this swinging movement, the large sprocket 24 is held from rotation but the small sprocket 20 swings with the arm 10. Such swinging movement causes the sprocket 20 to be turned by the chain 22 through 180°, so that in one limiting position the work will be supported in a predetermined set-up, and in the other limiting position the work will be similarly supported but exactly reversed, so that a different operation may be performed thereon by a second associated machine tool.

It will be noted that the entire transfer mechanism is controlled and operated by the single valve 46, and that the air pressure will maintain the arm 10 firmly in engagement with one or the other of the stops 50 or 51 until the valve 46 is shifted to neutral or reverse position.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

A turntable transfer mechanism comprising a supporting arm, a main shaft on which said arm is secured, a work support pivoted at the swinging end of said arm, a relatively smaller sprocket fixed to said work support and concentric with its pivot, a relatively larger sprocket mounted in fixed position concentric with the axis of said main shaft, a chain connecting said two sprockets, a power arm fixed on said main shaft and having a radial slot, a crank arm having a roll movable in said radial slot, a supporting shaft for said crank arm, a fixed bearing for said supporting shaft, a pinion on said supporting shaft, a rack engaging said pinion, a manually-controlled air-operated cylinder-and-piston operating unit for said rack, and stops to limit swinging movement of said supporting arm in both directions, and said sprocket-and-chain connection being effective to reverse the angular position of the work as the supporting arm is swung 90°.

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