Jan. 12, 1965 P. TISHKEN 3,165,141

ADJUSTABLE FIXTURE

Filed May 26, 1961 3 Sheets-Sheet 1

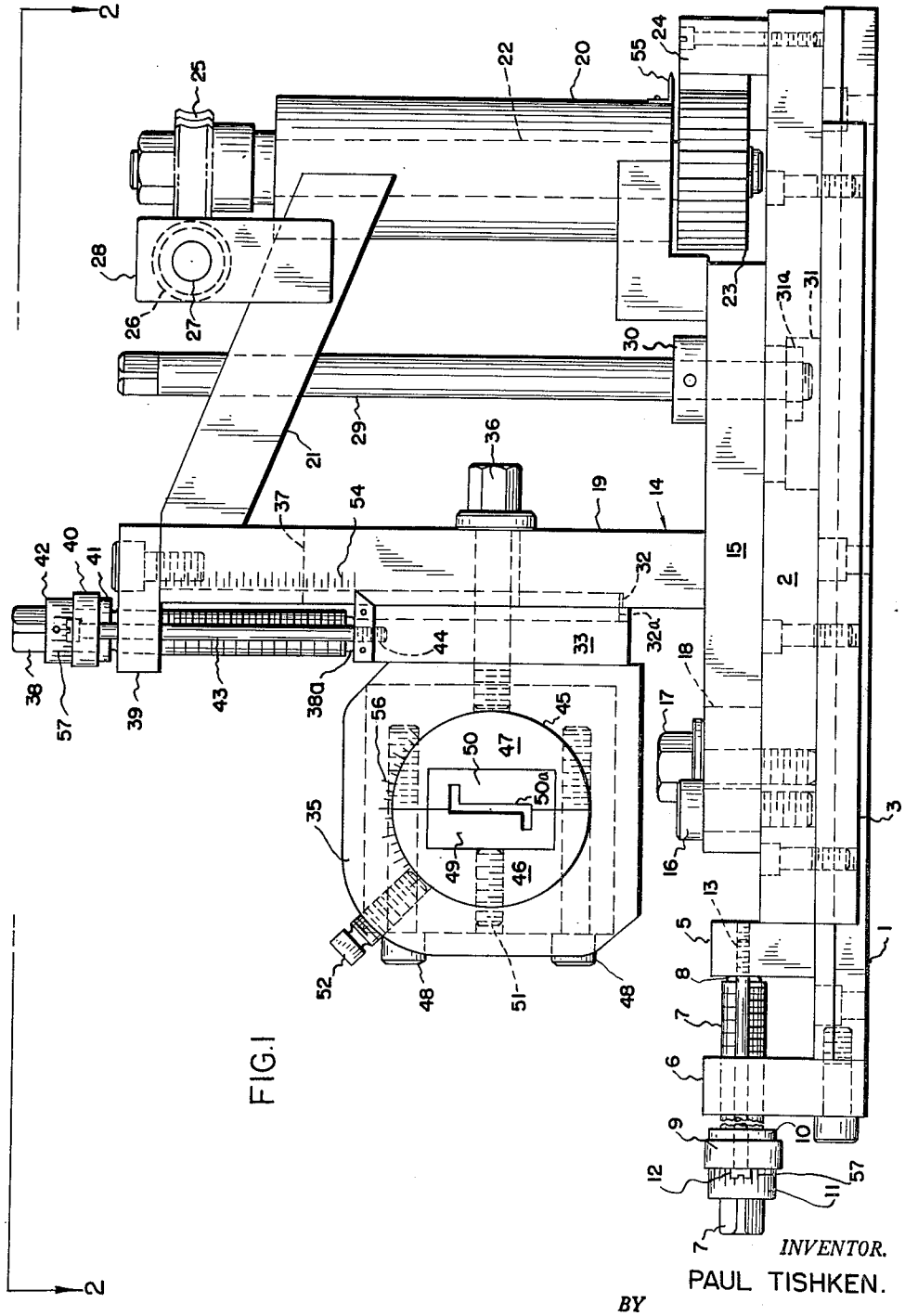


FIG. 1

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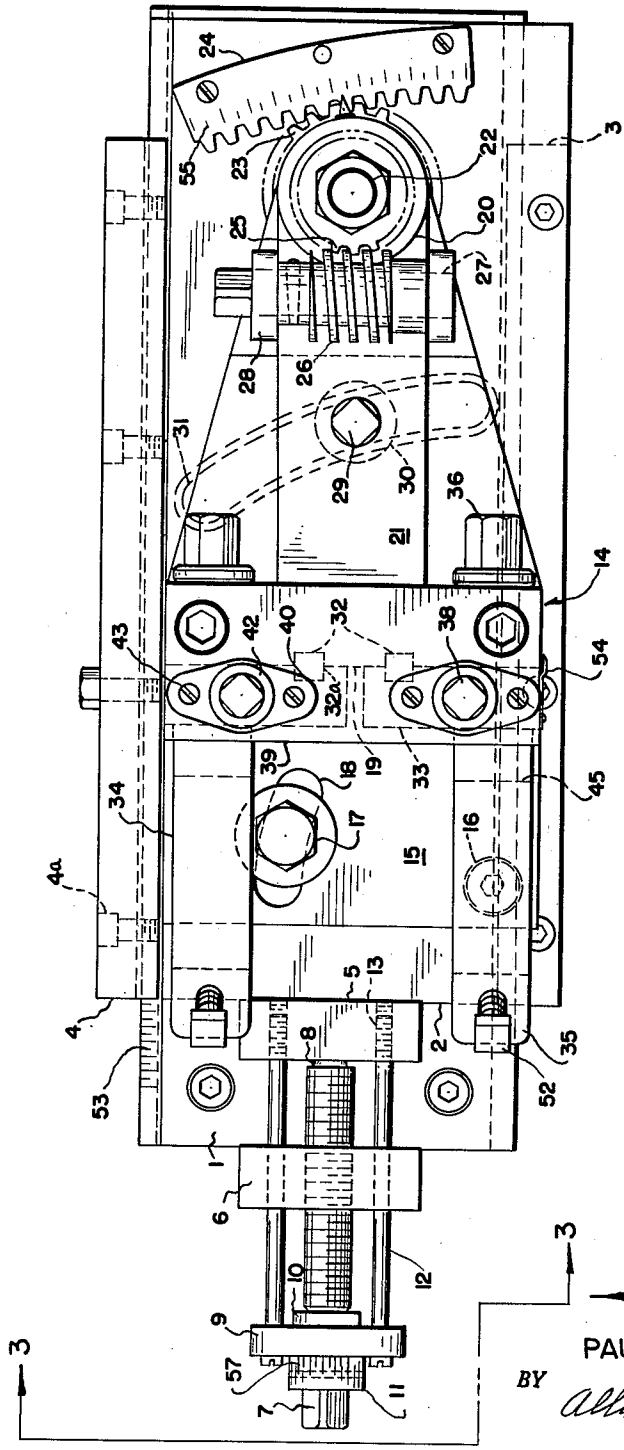


FIG. 2

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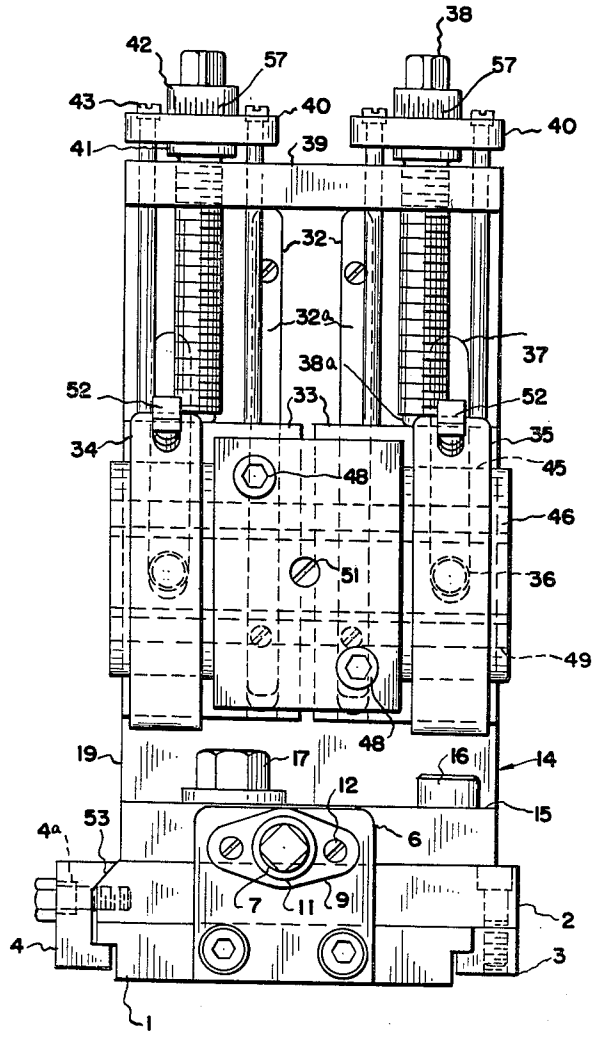


FIG.3

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ADJUSTABLE FIXTURE

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3 Claims. (Cl. 153—32)

This invention relates to adjustable fixtures and particularly such a fixture as is adapted to precisely position a die to receive and straighten elongated advancing stock.

It is common to advance stock from a coil through rolling machines wherein a series of rollers progressively applies to such stock longitudinally extending contours. Frequently, as such contoured stock emerges from the machine, it tends to respond to stresses imposed by its previous coiled condition and by the effect of the various rollers, by assuming a longitudinal curve. The present invention positions a die to receive such advancing stock, which is straightened to rectilinear form by passage through said die.

An object of the invention is to provide a fixture adapted for precision adjustment to position a die, in the path of advancing stock.

Another object is to provide a plurality of adjustment mechanisms on such a fixture whereby the positions established by said mechanisms may be coordinated to establish the die in the path of advancing stock.

These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawings, wherein:

FIG. 1 is a side elevational view of the fixture on the line 1—1 of FIG. 2.

FIG. 2 is a plan view of the fixture on the line 2—2 of FIG. 1, omitting said die.

FIG. 3 is an end elevational view of the fixture on line 3—3 of FIG. 2.

In these views the reference character 1 designates a slideway which may be secured to the table of a rolling machine (not shown) or otherwise supported in a use position. A slide 2 is mounted on the slideway for reciprocal rectilinear sliding travel thereon. Said slide is retained on the slideway and directed in said travel by a flanged guide-strip 3 secured to and beneath a longitudinal marginal portion of the slide. A second such guide-strip 4 is upwardly and inwardly formed with an angled face, engageable with a corresponding face extending longitudinally of the slide. Tightening screw 4*a* engages said faces and causes the angled face on the guide-strip to cam upwardly on the engaging face, drawing the guide strip into tight engagement with the slideway to resist sliding travel of the slide.

On the front end of the slide is secured an actuator block 5, and on the front end of the slideway is secured an anchor block 6. An adjusting screw 7 passes threadedly through the anchor block 6 and has its threadless end portion 8 rotatably engaged against the front face of the actuator block 5. Thus, rotation of the adjuster screw 7 in one direction causes said threadless end portion 8 to push against said actuator block 5, forcing the slide 2 backwardly.

At its forward end portion, the adjusting screw 7 passes rotatably through a strap 9. Said strap is held against movement axially on the screw by an annular shoulder 10 formed on the screw and a collar 11 releasably, rigidly carried by the screw. A pair of elongated screws 12 have headed ends engaged with the strap and threaded end portions screwed into tapped holes 13 in the actuator block 5. Thus, rotation of the adjusting screw 7 in the opposite direction causes the screws 12 to draw the slide 2 forwardly.

The front end portion of the adjusting screw 7 is formed with flats to accept a wrench or crank (not shown), but a conventional hand knob may be applied to said screw if desired. This is true also of the hereinafter described elements 27, 29 and 38.

Surmounting the slide 2, is a carriage 14, including a flat base 15 resting on said slide and slidable thereon in reciprocable arcuate travel about a pivot element 16, A lock screw 17 passes through an arcuate slot 18 to engage in the slide, and may be tightened to resist undesired arcuate travel of the carriage.

Rigidly, upwardly projecting from the central portion of the base 15 is a mounting plate 19, and a vertically disposed tubular bushing 20 is secured to the rearward extremity of said base. A bridge 21 extends between the upper end portions of the mounting plate and the tubular bushing.

A shaft 22 is rotatable in the bushing 20, and at its lower end portion rigidly, removably carries a pinion 23. The teeth of said pinion mesh with those of an arcuate rack 24 secured to the slide, whereby rotation of the shaft and gear, will move the pinion along the rack, thus arcuately swinging the associated carriage about the pivot element 16.

Such rotation is effected by a worm gear 25 rigidly mounted on the upper end portion of the shaft 22 and drivable by a worm 26 rigid upon a shaft 27 disposed transversely to the shaft 22. The shaft 27 journals in a pair of upstanding lugs 28 secured, as by welding, to said bridge 21 and the tubular bushing 20. As aforesaid, the shaft 27 is adapted to receive a wrench or crank or may mount a hand-knob.

To afford additional resistance to inadvertent arcuate travel of the carriage about the pivot element 16, an elongated locking screw 29, passes rotatably through the bridge 21 and base 15. Just above the base, a collar 30 resists downward movement of the screw 29. The lower end portion of said screw passes through the slide 2 into an arcuately formed T-slot 31 and receives a nut 31*a* slidable in said slot. By turning the screw 29 to draw the nut 31*a* tightly upwardly in the T-slot, said arcuate travel of the carriage is resisted. By reversely turning said screw, said resistance may be eliminated to afford said arcuate travel.

In the mounting plate 19, parallel keyways 32 receive and rigidly retain keys 32*a*. A pair of blocks 33 engage and are guided by said keys in vertical travel on the mounting plate. Die supporting bracket plates 34, 35 respectively abut the respective blocks 33, and are threadedly received on the threaded end portions of screws 35. Said screws extend through vertically elongated slots 37 in the mounting plate 19, and thence through the blocks 33. In their vertical travel, said blocks carry said screws 36 and said dies supporting bracket plates 34, 35.

The headed ends of the screws are engageable with the rear face of the said mounting plate to afford frictional resistance to said vertical travel. Said screws may be rotated to draw the plates 34, 35 into tight engagement against the blocks 33, thus frictionally resisting rotation of said plates, or reversely rotated to release said bracket plates from said engagement, so that the plates may turn upon the screws to desired positions about the longitudinal axis of said screws. So reversely rotating said screws 36 disengages the heads thereof from said mounting plate to afford both the aforesaid vertical travel and said rotative positioning of said bracket plates.

A pair of adjusting screws 38 have threaded engagement through an anchor plate 39, and have their unthreaded end portions 38*a* bearing rotatably against the upper faces of the respective blocks 33, whereby rotation of said screws in one direction tends to force said blocks to move downwardly. At their upper ends said adjusting screws respectively pass rotatably through respective straps 40. Each strap is held against axial movement on

its adjusting screw by an annular shoulder 41 and a collar 42 releasably, rigidly carried by the adjusting screw.

Each adjusting screw 38 is flanked by elongated screws 43 having headed ends engaged with the respective straps, and threaded ends screwed into tapped holes 44 formed in the respective blocks 33. Thus, rotation of said adjusting screws 38 in reverse direction to that aforesaid, causes said screws 43 to draw said blocks 33 upwardly.

The bracket plates 34, 35, are formed with holes 45 which receive and support the end portions of a die holder formed of two longitudinally separable sections 46, 47. Screws 48 clamp said sections upon longitudinally separable die sections 49, 50. A set screw 51 ensures that said die sections are securely clamped together. Set screws 52 releasably secure the end portions of the die holder in the apertures 45. Longitudinally, the die is formed with an opening 50*a* having the cross-sectional dimensions of the advancing stock.

To set the fixture up for use, the slideway is positioned on a supporting surface so that the slide will be slidable substantially horizontally and transversely to the path of advancing stock. Thus, any vertical travel of the blocks 33 on the mounting plate will also be substantially transverse to said path of advancing stock.

All of the various locking screws are released, adjustments of slide 2, the carriage 14, and the blocks 33 and bracket plates 34, 35, are coordinated to position the die 49, 50 to receive and straighten the advancing stock.

It should be noted that the die holder 46, 47 is rotatably adjustable in the bracket plates 34, 35, when screws 48 and 52 are not tightened, thus affording still an additional adjustment.

It is to be noted that in adjusting either of the blocks 33 individually, the effect is to increase or decrease the spacing between the pivot screws 36. Also, such adjustment raises or lowers the end of the die holders 46, 47 being supported by the bracket plate associated with the block being adjusted. As the end of the die holder is so moved, the supporting bracket plates must pivot on the screws 36. One of the set screws 52 must be loosened to allow a slight relative movement of the die holder and a bracket plate, such movement resulting from said increased or decreased spacing of said pivot screws.

Preferably calibrations are applied as shown at 53, 54, 55, 56, and 57, so that readings may be taken once the die is satisfactorily positioned. Thus, if it becomes necessary for any reason to disturb the adjustments, they may be reset without trial and error to reestablish the position of the die.

What I claim is:

1. The combination in an adjustable fixture to position a die to receive and straighten advancing stock, and including

a slideway,

a slide reciprocably slidable to selective positions of adjustment upon the slideway,

adjusting means interconnecting said slide and slideway and actuable to precisely establish any such position,

a carriage, including a base,

a pivot element securing said base upon said slide for arcuate travel thereon to selective positions of adjustment about the axis of said pivot element,

means carried by said carriage, reacting upon means carried by said slide to precisely establish any such position, of

(*a*) a mounting plate carried by the base and extending therefrom,

(*b*) a pair of spaced die supporting plates,

(*c*) a pair of pivot mountings respectively independently mounting the respective plates,

(*d*) a straightening die elongated between and rigidly, releasably supported by, and interconnecting said plates, whereby pivotal movement of one die supporting plate responsive to travel of its pivot mounting is transmitted to the other die supporting plate through the interconnecting supported die.

2. In the combination as set forth in claim 1, said die supporting plates (*b*) being formed with

(*e*) holes receiving the end portions of said die (*d*),

(*f*) means for releasably securing each end portion independently to afford a relative movement between the die and a die supporting plate responsive to said travel of one of said pivot mountings.

3. The combination as set forth in claim 2,

(*g*) a pair of blocks respectively carrying said pivot mountings,

said means to establish said positions of adjustment being operably effective upon said blocks, said pivot mountings (*c*) being engageable with said mounting plate to resist displacement from said positions of adjustment.

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