Jan. 3, 1950 H. C. BRAMEL 2,493,103

SHAPING MACHINE

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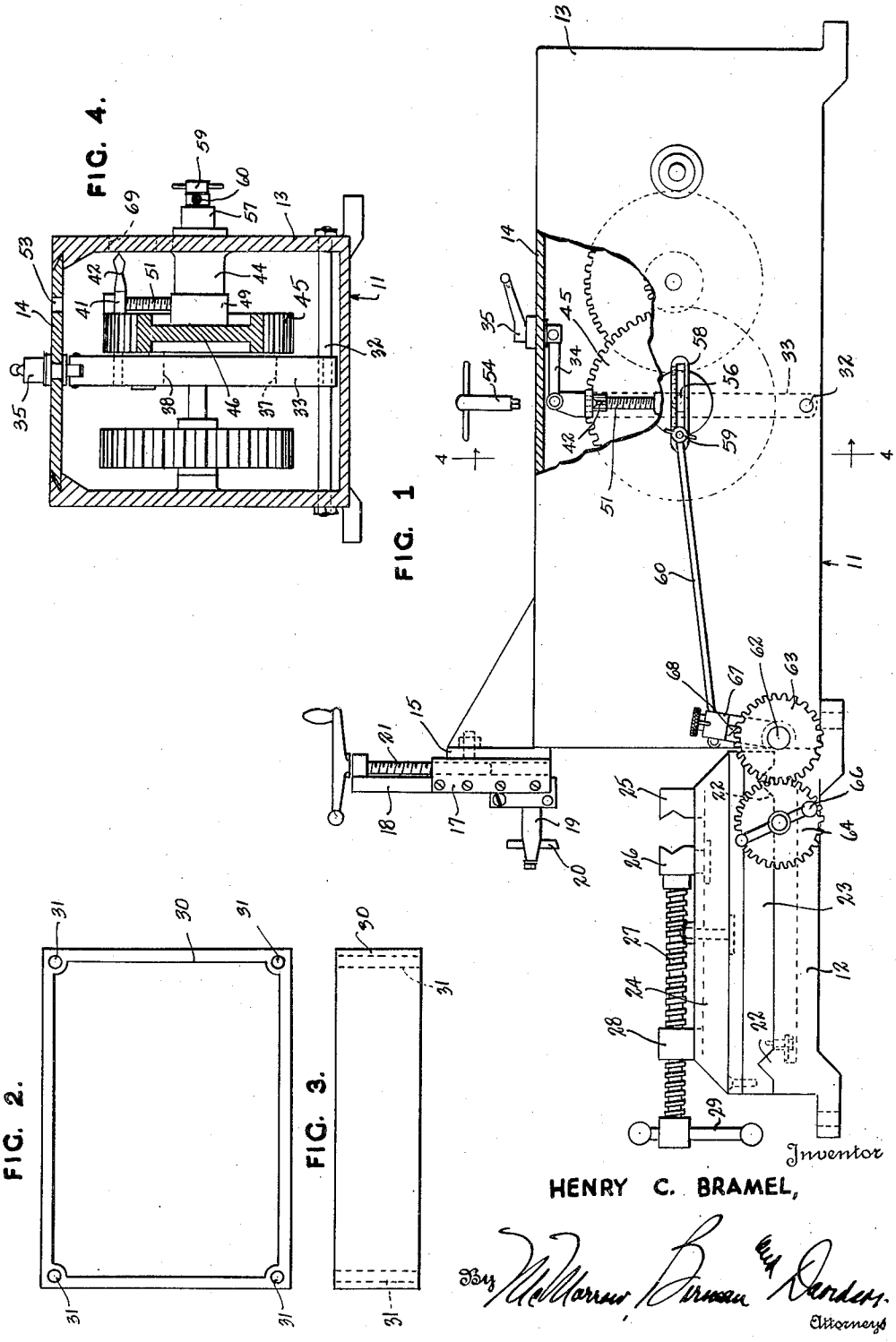


FIG. 1.



FIG. 4.



FIG. 2.



FIG. 3.

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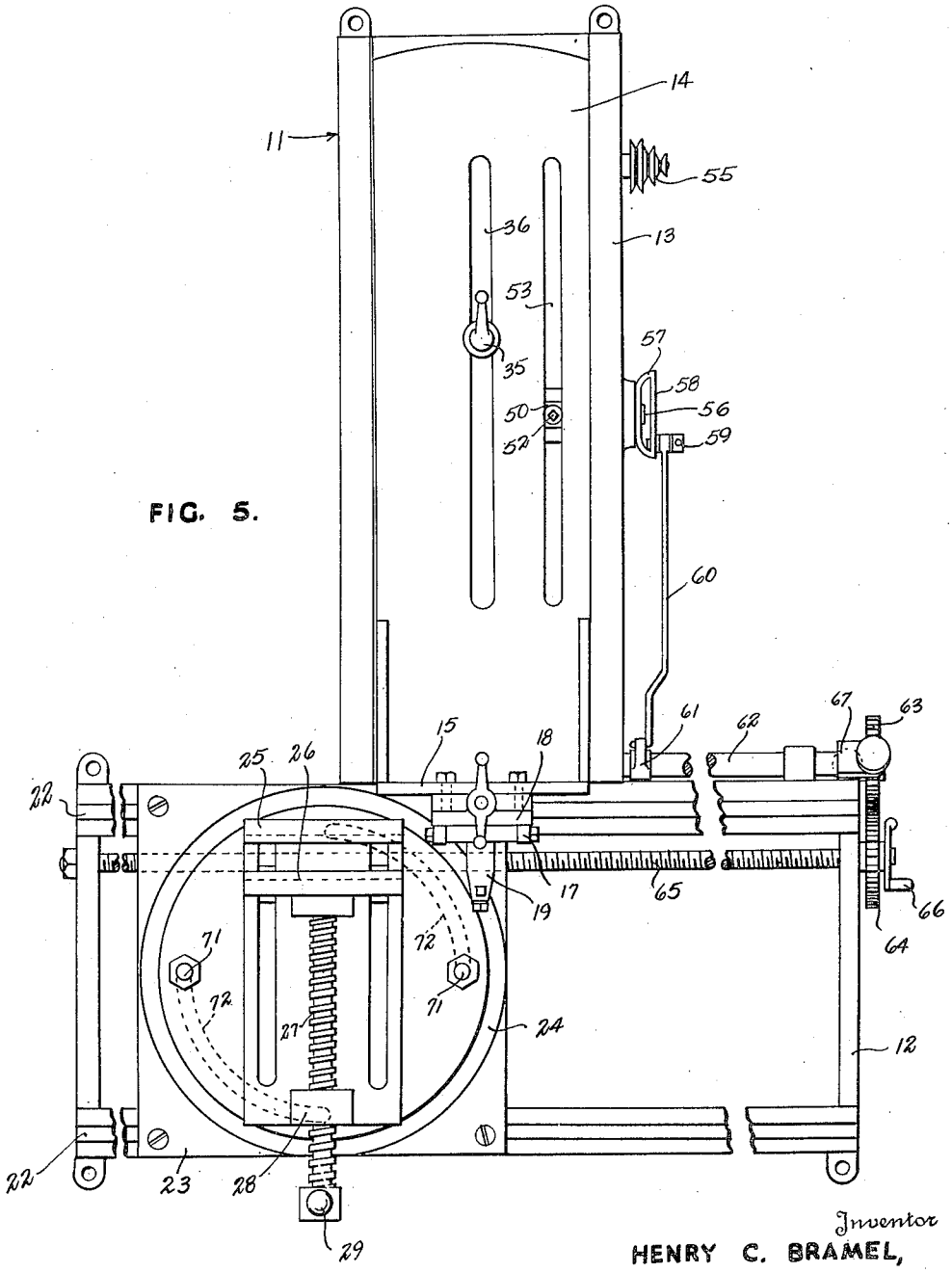



FIG. 5.

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FIG. 6.

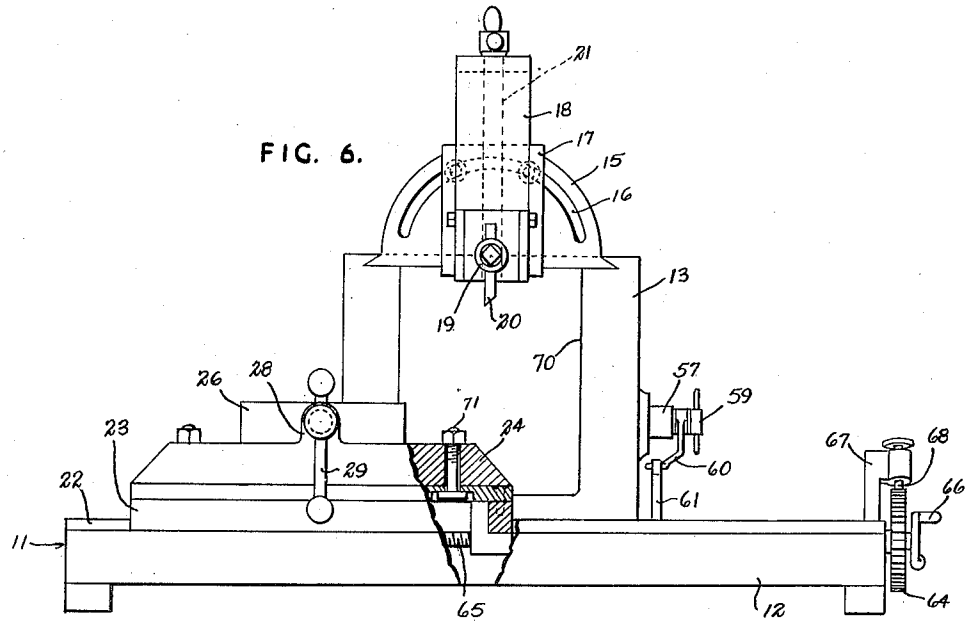



FIG. 7.

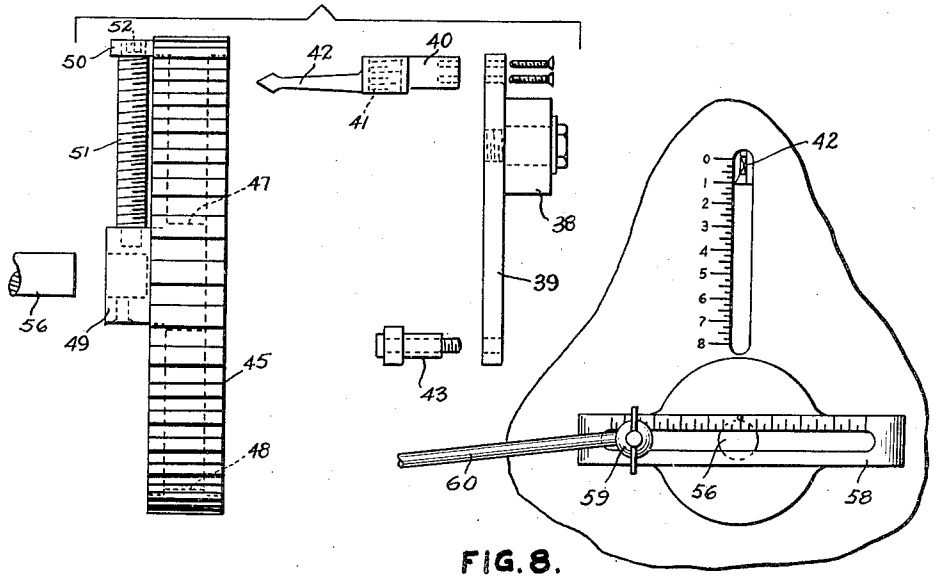



FIG. 8.

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2,493,103

# UNITED STATES PATENT OFFICE

2,493,103

## SHAPING MACHINE

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Application January 22, 1946, Serial No. 642,666

4 Claims. (Cl. 90—39)

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This invention relates to shaping machines, and more particularly to shaping machines having automatic work feeding mechanisms.

A main object of the invention is to provide a novel and improved shaping machine of simple construction and efficient operation, said machine being provided with improved means for adjusting the length of stroke of its tool carrying member and for adjusting the rate of feed and the direction of feed of the work.

A further object of the invention is to provide an improved shaping machine which is economical to manufacture, easy to operate and is adapted to accommodate a wide range of thicknesses of work by the use of adjusting shim plates in the work supporting portion thereof.

Further objects and advantages of the invention will be apparent from the following description and claims and from the accompanying drawings, wherein:

Figure 1 is a side elevational view, partly broken away, of a shaping machine constructed in accordance with the present invention.

Figure 2 is a plan view of a shim block adapted to be employed in the work supporting portion of the shaping machine of Figure 1.

Figure 3 is a side elevational view of the shim block of Figure 2.

Figure 4 is a transverse cross-sectional view taken on line 4—4 of Figure 1.

Figure 5 is a top plan view of the shaping machine of Figure 1.

Figure 6 is a front end elevational view of the shaping machine of Figure 1.

Figure 7 is a detail view showing the components of the stroke adjusting mechanism employed in the shaping machine of Figure 1.

Figure 8 is a fragmentary view of the portion of the side wall of the housing having the scale means which cooperates with the pointer.

Referring to the drawings, 11 designates the base of the machine, said base comprising an integral work supporting portion 12 and an integral housing 13 for the driving mechanism of the machine. Slidably mounted in dovetailed grooves formed in the top of housing 13 is a slide plate 14 carrying at its forward end a semi-circular tool post supporting disc 15 having an arcuate slot 16 formed therein. Adjustably supported in slot 16 and secured to disc 15 is a tool post housing member 17 which has mounted therein a vertically adjustable tool post 18 carrying at its lower end a tool holder 19 in which a shaper tool 20 is secured. An adjusting screw 21 is provided

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for raising and lowering tool post 18 with respect to housing member 17.

Work supporting base portion 12 is formed with a pair of transverse guide ribs 22, 22 on which is slidably mounted for transverse guided motion thereon a table member 23. Secured to table member 23 is a vise block member 24 having formed thereon a stationary vise jaw element 25. Slidably mounted for longitudinal movement in vise block member 24 is a movable vise jaw element 26 which is provided with a clamping screw 27 threaded through a stationary lug 28 formed on block member 24 and carrying a handle 29 for rotating screw 27 to move jaw element 26 with respect to stationary jaw element 25 for inserting a work piece between or removing the work piece from the jaw elements. Where a work piece of relatively small thickness is being machined, a shim block 30 may be employed between table member 23 and vise block 24, said shim block being formed at its corners with openings 31 for the passage of securing bolts therethrough. This avoids the necessity of lowering tool post 18 an excessive amount to reach a small work piece and thereby prevents chattering of the tool during the shaping operation.

Pivotally mounted in housing 13 on a transverse shaft 32 is an oscillating drive arm 33 which is connected to slide plate 14 by a link 34 which carries at its end a clamping screw member 35 arranged for adjustable securement in a longitudinal slot 36 formed in slide plate 14. Arm 33 is formed with an elongated slot 37 in its intermediate portion which receives a block member 38. Block member 38 is rotatably secured to a bar element 39 which has secured thereto at its top end a shouldered arm 40 having an intermediate nut portion 41 and carrying a pointer element 42. Secured to the bottom end of bar element 39 is a shouldered lug element 43 which is parallel to arm 40. Journalled in the side wall of housing 13 in a bearing element 44 integral with said housing wall is a gear member 45 having a web 46. Web 46 is formed with a first radial slot 47 which slidably receives shouldered arm 40 and with a second radial slot 48 diametrically opposed to slot 47 which slidably receives shouldered lug element 43. Gear member 45 is provided with a hub collar 49 and is formed with a peripheral lug 50 adjacent slot 47. Pivotally supported in lug 50 and collar 49 is a screw 51 arranged parallel to slot 47. Screw 51 is threadedly engaged with nut portion 41 of arm 40. The top end of screw 51 is formed with a hexagonal socket 52 adapted to receive the end of a hexagonal wrench for rotating screw 51

to vary the radial position of arm 40 with respect to gear 45 and to thereby vary the position of block 38 in slot 37 of the oscillating driving arm 33. This varies the stroke of slide plate 14. A longitudinal slot 53 is formed in plate 14 through which the shank of a hexagonal wrench 54 may be inserted to engage socket 52 of screw 51 when adjustment of the stroke of the slide plate is to be made.

Gear 45 is driven from a pulley 55 through a train of reduction gears provided with suitable speed changing means forming no part of this invention.

Secured to hub collar 49 is a shaft 56 which extends through bearing member 44 and the side wall of housing 13 and carries rigidly secured to its outer end a bracket member 57 having a longitudinally slotted diametral arm 58. Pivotally secured to arm 58 by an adjustable post member 59 which may be clamped in any desired position in the diametral slotted arm 58 is a link 60 pivotally connected to a crank arm 61 carried by a transverse shaft 62 journalled to base 11 adjacent the rear transverse edge of work supporting portion 12. Shaft 62 carries an idler gear 63 which meshes with a work feed gear 64 mounted on a transverse threaded shaft 65 threadedly engaging table member 23. The end of shaft 65 is provided with a handle 66 for manually rotating the shaft to feed the work to the shaping tool by hand when so desired. Shaft 62 carries a pawl arm 67 having mounted therein a reversible spring biased pawl element 68 which resiliently engages the teeth of idler gear 63 for intermittently rotating said gear in forward steps responsive to the reciprocation of link 60. The rate of rotation of gear 63, and hence the rate of feed of the work, may be adjusted by adjusting the radial position of post member 59 on slotted arm 58. To reverse the direction of feed, post member 59 is moved to a position 180° out of phase with its former position in slotted arm 58 and pawl element 68 is axially turned 180° in arm 67. Slotted arm 58 is provided with appropriate markings to indicate various feed speeds.

The side wall of housing 13 is formed with a vertical slot 69 adjacent pointer element 42 so that said pointer element may be viewed from the outside of the machine. Slot 69 is provided with appropriate markings to indicate the various stroke lengths of slide plate 14.

The front wall of housing 13 is cut out, as shown at 70, to allow the tool post structure to be retracted to a substantially flush position of the tool holder 19 with respect to said front wall.

Block 24 is formed in two sections, the upper section being adjustably secured to the lower section by bolts 71 passing through arcuate slots 72 to allow angular adjustment in a horizontal plane of the upper section with respect to the lower section of the block, to thereby allow the work to be angularly positioned in its horizontal plane as desired.

While a specific embodiment of a shaping machine has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore it is intended that no limitations be placed on the invention other than as defined by the scope of the appended claims.

What is claimed is:

1. In a shaping machine including a reciprocable tool slide, a housing slidably mounting said slide and including a side wall, said slide comprising a top wall for said housing, means mounting a rotary drive member in said housing, a driven arm pivotally mounted at its lower end in said housing and pivotally connected at its upper end to said slide to drive the same; the improvement comprising said drive member being formed with a pair of diametral slots therein, a bar element, a laterally-directed arm, means mounting said arm on one end of said element, said arm including a portion slidable in one of said slots, said arm including an integral nut extending laterally beyond said drive member, said arm including an integral pointer extending laterally beyond said nut, a lug carried by the other end of said bar element and slidable in said other slot, a radially-directed screw carried by said drive member and threadedly engaged with said nut to adjust said nut and bar member radially of said drive member upon rotation of said screw, means operatively connecting said bar member to said drive arm to drive the latter and said slide upon rotation of said drive member, said screw being formed at one end with tool-engaging means, said slide being formed with an opening therein over said screw and adapted for the insertion of a screw-adjusting tool therethrough, said pointer terminating inwardly of said housing adjacent said side wall, said side wall being formed with a slot therein in the region of said pointer, and said last-named slot including means cooperating with said pointer designating the radial adjustment of said bar element.

2. In a shaping machine including a reciprocable tool slide, a housing slidably mounting said slide and including a side wall, said slide comprising a top wall for said housing, means mounting a rotary drive member in said housing, a drive arm pivotally mounted at its lower end in said housing and pivotally connected at its upper end to said slide to drive the same; the improvement comprising a bar, means mounting said bar on said drive member for rotation therewith and adjustment radially thereof, said bar including an integral lateral extension, said extension including a nut and a pointer, a radially-directed screw carried by said drive member and threadedly engaging said nut to adjust said bar radially of said drive member upon rotation of said screw, said slide being formed with an access opening therein for rotating said screw, said side wall being formed to provide scale means cooperating with said pointer to indicate the radial position of said bar, and means operatively connecting said bar to said drive arm to drive the latter and said slide upon rotation of said drive member.

3. In a shaping machine including a reciprocable tool slide, a housing slidably mounting said slide and including a side wall, said slide comprising a top wall for said housing, means mounting a rotary drive member in said housing, a drive arm pivotally mounted at its lower end in said housing and pivotally connected at its upper end to said slide to drive the same; the improvement comprising a bar, means mounting said bar on said drive member for rotation therewith and adjustment radially thereof, said bar including an integral lateral extension, said extension including a pointer, means for adjusting said bar radially of said drive member, said side wall being formed to provide scale means cooperating with said pointer to indicate the radial position of said bar, and means operatively connecting said bar to said drive arm to drive the latter and said slide upon rotation of said drive member.

4. In a shaping machine including a recipro-

cable tool slide, a housing slidably mounting said slide and including a side wall, said slide comprising a top wall for said housing, means mounting a rotary drive member in said housing, a drive arm pivotally mounted at its lower end in said housing and pivotally connected at its upper end to said slide to drive the same; the improvement comprising a bar, means mounting said bar on said drive member for rotation therewith and adjustment radially thereof, said bar including an integral lateral extension, said extension including a nut, a radially-directed screw carried by said drive member and threadedly engaging said nut to adjust said bar radially of said drive member upon rotation of said screw, said slide being formed with an access opening therein for



rotating said screw, and means operatively connecting said bar to said drive arm to drive the latter and said slide upon rotation of said drive member.

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