March 10, 1925. 1,529,557

G. H. SIMON

SELF CENTERING JIG

Filed March 27, 1922 2 Sheets-Sheet 1

Fig. 1.

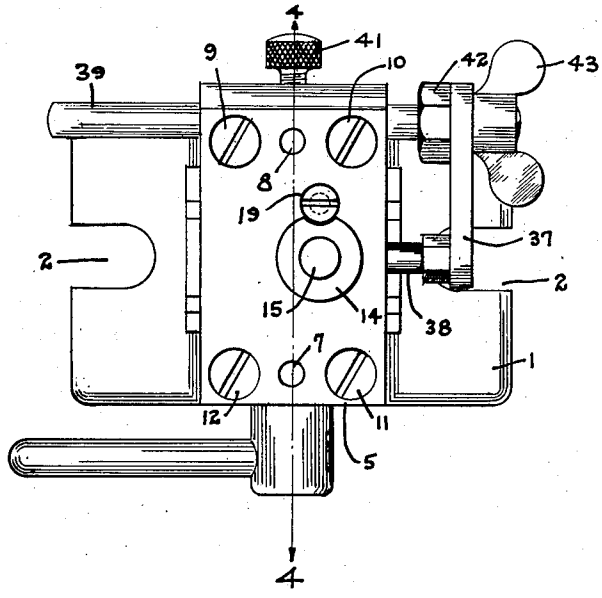


Fig. 2.

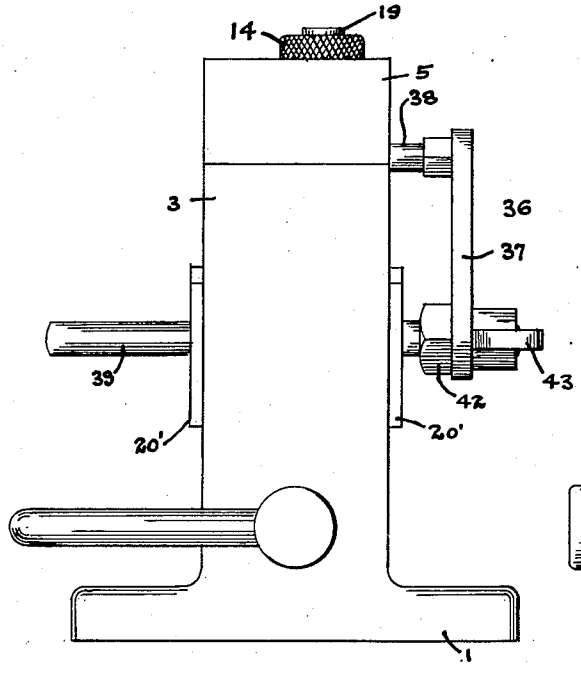
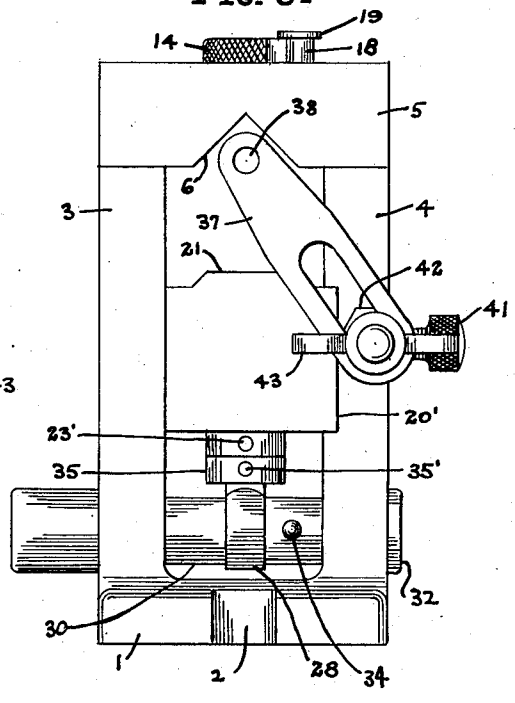


Fig. 3.



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Fig. 5.

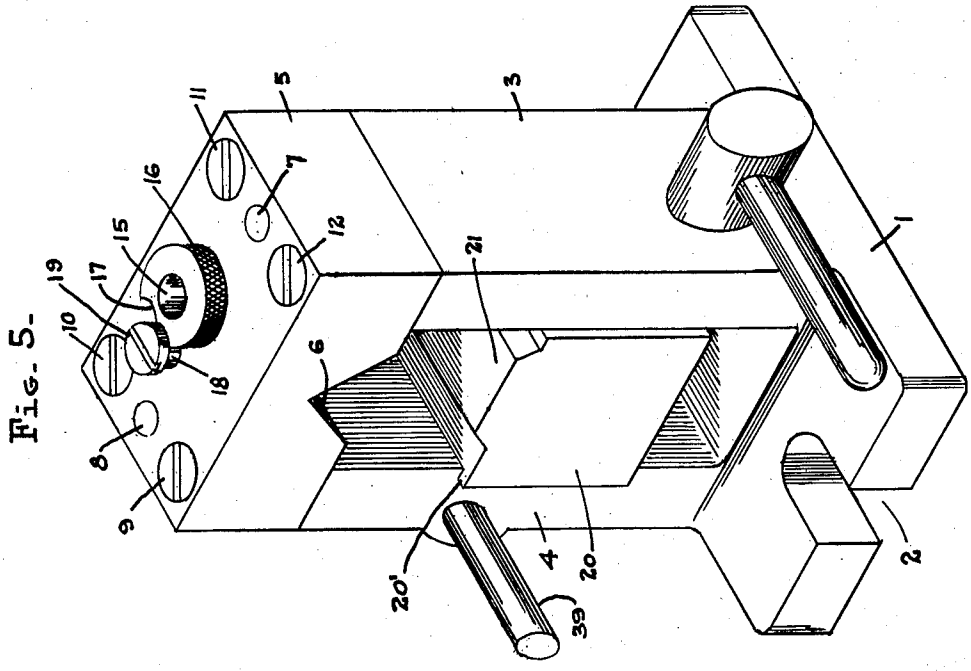
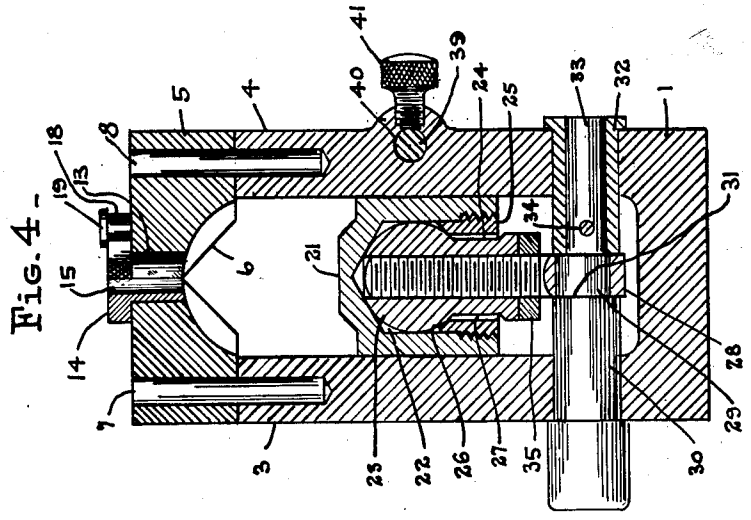


Fig. 4.



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Patented Mar. 10, 1925. 1,529,557

UNITED STATES PATENT OFFICE.

GEORGE H. SIMON, OF COVINGTON, KENTUCKY.

SELF-CENTERING JIG.

Application filed March 27, 1922. Serial No. 547,102.

To all whom it may concern:

Be it known that I, GEORGE H. SIMON, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented a certain new and useful Improvement in Self-Centering Jigs, of which the following is a specification.

My invention relates to self centering jigs for drilling and reaming through round or cylindrical metal machine parts, such as shafts, bolts, boring and facing bars, etc.

The objects of my invention are to provide simple and efficient means adapted to be easily and quickly adjusted to receive and hold varying sizes of material to be operated on; to provide simple and convenient means for a large variety of drills and reamers used upon all standard drilling machines, thereby dispensing with special machinery for this class of work, and to provide means which will insure absolute accuracy in the drilling or reaming operation.

My invention consists in the parts and combination and arrangement of parts and in the details of construction as herein set forth and claimed.

In the drawings:

Fig. 1 is a plan view;

Fig. 2 a side elevation;

Fig. 3 a rear elevation;

Fig. 4 a vertical section taken on the line 4—4 of Fig. 1; and

Fig. 5 isometric view of the device.

In the embodiment of my invention as illustrated and which shows a preferred construction I provide a base 1 having end slots 2 to receive fastening bolts (not shown) whereby the jig is adapted to be firmly mounted upon a drill press. Suitable standards 3 and 4 spaced apart from each other extend upwardly from the base. A V-block 5 having a V-groove 6 in its under side is mounted and securely held in position on said standards by dowel pins 7 and 8 and screws 9, 10, 11 and 12 respectively. The V-block is provided with a vertical bore 13 disposed concentric with said V-groove to receive and hold slip bushings 14 having holes 15 of varying sizes therethrough to receive drills of different diameters and each having a knurled head 16 whereby it is supported in said bore and may be turned by hand when inserting and removing it. A curved recess 17 is formed in one side of said head. Screw 18 is mounted in the top of said V-block and is provided with head 19 which is adapted to extend over knurled head 16 of the bushing to hold it in position. When it is desired to insert the bushing it is turned to the position shown in Fig. 1 and pushed downwardly, the head 19 engaging curved recess 17 thereby permitting knurled head 16 to pass below head 19 whereupon the bushing is turned to the position shown in Fig. 5 and the screw head 19 is clamped down against knurled head 16 of said bushing to hold it firmly in position.

The slip bushings are used to permit a large variety of sizes of drills and reamers to be used. The jig's accuracy depends only upon the accuracy with which the V-block is made. When the V-block is accurately made the work in every instance will be accurately centered and securely held while being drilled or reamed.

A work holding and clamping block 20 having retaining flanges 20′ which extend over and engage the walls of said standards, is mounted to slide vertically therebetween. Said work holding and clamping block 20 is provided with a raised work engaging surface 21 on its upper side and on its lower side is provided with a socket 22, the lower end wall of which is screw threaded. A ball-nut 23 having a tubular flange 24 on its lower side is supported in said socket by thrust sleeve 25 screwed therein and having inward bevel 26 upon its upper end to engage the lower part of ball-nut 23. A slight clearance 27 is provided between the tubular flange and thrust sleeve to permit the ball-nut to move relatively to the clamping block while adjusting said clamping block to hold it in clamping engagement upon the work. Ball-nut 23 is provided with several holes 23′ and lock nut 35 is provided with several holes 35′ to engage a spanner wrench by which they are adapted to be turned on eye bolt 28. Said eye bolt is pivotally mounted upon cam 29 of cam-shaft 30 pivotally mounted in standards 3 and 4 and is held on said shaft by shoulder 31 and flanged collar 32 which is fixed upon the reduced end 33 of cam-shaft 30 by means of tapered pin 34. The cam-shaft is provided with a suitable handle or lever by which said shaft is oscillated.

I provide stop measuring gauge 36 having a slotted arm 37 with a stem 38 adapted to abut one end of the work and said arm is

mounted upon spindle 39 slidably supported in hole 40 of standard 4 and is adapted to be moved horizontally therein and held in any desired adjusted position by set screw 41. Spindle 39 is provided near one end with head or nut 42 engaging one side of slotted arm 37 which arm is held in the desired adjusted position by wing nut 43.

To adjust the holding and clamping block to receive varying sizes of work to be operated upon, simply turn the ball-nut and lock nut up or down upon eye bolt 28 by means of a spanner wrench. The ball-nut 23 is adapted to move in socket 22 to take care of the swivel caused by the cam shaft 30 in clamping or unclamping the work to be operated upon.

Thrust sleeve 25 holds ball-nut 23 in position to give the work holding and clamping block 20 its down stroke. It is held in position, after proper adjustment is made.

Spindle 39 is made long enough to give the gauge a wide range of adjustment.

Special advantages of this jig are its simplicity, convenience, rapidity and ease of operation with simple and convenient provision for using any size of drill that can be used on any diameter and any length of material within the range of the jig with absolute accuracy in drilling through the exact center of the shaft or other stock which may be clamped therein.

It will be apparent that my invention is capable of some modification without departure from its scope or spirit as defined in the claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a self centering jig, a base having standards thereon suitably spaced apart, a V-block secured thereon and having a bore concentric with the V in said V-block, a hollow holding and clamping block vertically and slidably mounted between said standards, a ball-nut engaging said hollow holding and clamping block and having a tubular flange thereon, a thrust sleeve screwed into said hollow holding and clamping block to provide downward thrust of the ball-nut, means for locking said thrust sleeve in adjusted position, an eye bolt screwed into said ball-nut and locked therein, a cam shaft pivotally mounted in said standards and having its cam engaging the eye of said eye bolt, and means for operating said cam shaft.

2. In a self centering jig, a base having standards theron suitably spaced apart, a V-block secured thereon and having a bore concentric with the V in said V-block, a hollow holding and clamping block vertically and slidably mounted between said standards, a ball-nut engaging said hollow holding and clamping block and having a tubular flange thereon, a thrust sleeve screwed into said hollow holding and clamping block to provide downward thrust of the ball-nut, an eye bolt screwed into said ball-nut, a lock nut on said eye bolt engaging said flange to hold said eye bolt and ball-nut in fixed relation to each other, a cam shaft mounted in said eye bolt and standards and having a lever adapted to oscillate said cam shaft whereby said holding and clamping block is moved into holding engagement with the work when moved into open position or into closed position, as desired, substantially as set forth and for the purposes specified.

3. In a self centering jig, a base, a holding and clamping block therein, means for adjusting and holding said holding and clamping block, a V-block mounted on said standards and having a V-groove on its under side and a bore therethrough concentric with said V-groove, a flanged bushing adapted to engage said bore and having a recess in one side of said flange and a screw mounted in said V-block and adapted to engage and hold said flanged bushing, substantially as set forth and for the purposes specified.

4. In a self centering jig, a base having standards thereon spaced apart from each other, a V-block secured on the top of said standards with a V-groove formed therein and a bore formed therethrough concentric with said V-groove, a holding and clamping block slidably mounted between said standards, a ball-nut mounted in said holding and clamping block, an eye bolt, means to hold said ball-nut and eye bolt in fixed relation to each other, a shaft having a shoulder thereon, a cam on said shaft adjacent said shoulder and adapted to engage the eye of said eye bolt, said shaft having a reduced end, a flanged sleeve in one of said standards adapted to receive said reduced end and a pin adapted to fasten said reduced end and sleeve together and means for oscillating said cam shaft.

GEORGE H. SIMON.