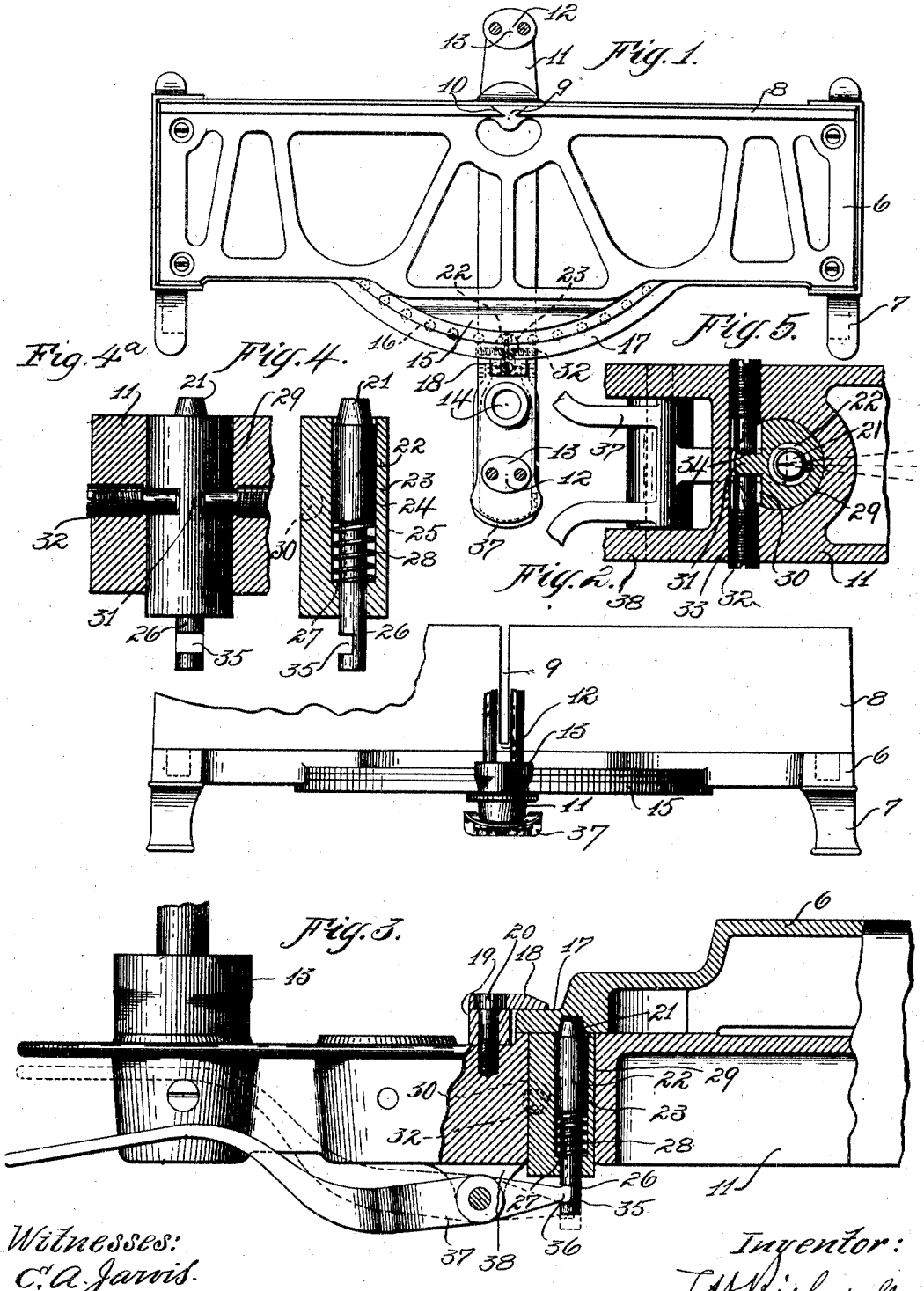
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F. H. RICHARDS.

PRECISIONIZER FOR INDEX PINS.

APPLICATION FILED OCT. 2, 1903.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

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PRECISIONIZER FOR INDEX-PINS.

SPECIFICATION forming part of Letters Patent No. 766,792, dated August 2, 1904.

Application filed October 2, 1903. Serial No. 175,422. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Precisionizers for Index-Pins, of which the following is a specification.

This invention relates to and has for an object to provide means to precisionize a locking or index pin.

In many mechanical devices or machines some of the working parts will be carried by a beam-arm or swiveled frame which will be supported by another portion of the machine and by which latter portion the position of the work will be controlled while being acted upon by the working parts. The accuracy of the work performed under such conditions depends in a large measure upon the accuracy or precision with which the arm is halted at the working position relatively to the positioning element. In some devices a beam-arm will be carried by a frame. The frame in its process of manufacture will be planed or milled upon several of its faces, and during which milling or planing there may arise some error or an accumulation of errors, and if the working parts are carried or controlled in their work by a beam pivoted to such frame the beam will generally be provided with a pin or bolt organized to coöperate with suitably-formed recesses in the frame, such recesses or sockets, which may be in the form of bolt-holes and will generally be positioned by a jig, having faces to bear upon some of the plane faces of the frame. The errors which have crept into the frame in its construction will be communicated through the jig to the location of the bolt-holes or index-pin notches or recesses for controlling the positioning of the operating parts carried by the arm, and such parts consequently will not perform their work at the exact point they would if the bolt-holes or recesses had been accurately located. To compensate for such inaccuracy and to precisionize the parts carried by the arm, the present invention provides means to move the bolt a slight amount to one side or the other to precisionize the working point of the elements carried by the beam relatively to the positioning-faces of the frame.

In the construction and finishing of the beam-arm and in the location of the pin-socket, the pivot-hole, and holes to carry the working elements error may arise, and even if no actual error occurs the unavoidable variations which occur in the construction of the frame may be such that they will be cumulative with the similarly unavoidable variations of the beam, and consequently error will be present and render the operations of the machine inaccurate, and at times in the making of the various sockets and holes on the beam sufficient error may creep in to require the precisionizing of the tool-controlling portion relative to the work-controlling portion. The bolt may be mounted in a socket in the beam-arm and have means for turning it eccentrically to such socket, so that it may be given a certain amount of angular movement about the axis or center of such socket. The bolt may be mounted in an eccentric bushing in a socket of the beam and the bushing be provided with engaging faces, whereby it may be slightly turned within its socket and there securely held, which turning will precisionize the bolt or will rather impart an angular advance to the bolt from its normal position, which when it sinks into one of the recesses provided for it will precisionize the arm.

One of the uses to which this invention may be applied is that of a miter-box, wherein a frame is provided having a back and bottom to accurately position the work and a beam-arm swiveled to such frame and carrying saw-guides, whereby the line of the cut of the saw may be shifted to any desired angle. A series of bolt-holes will be provided for the positions at which in actual practice the saw will generally be halted and the arm provided with an index pin or bolt which will engage with such notches or bolt-holes and lock the arm at its adjusted positions. In organizations employing an index-pin acting as such and not serving any of the functions of a bolt

or lock and which is not active to precisionize the parts other than to point to a scale the pin may be controlled or adjusted in a similar manner. The index-scale may be carried by the main portion of the machine or by a part movably carried thereby and the other part be provided with a socket and carry the index, which will be eccentrically disposed in the socket and so located that it may be turned on an arc concentric with the socket to move the index or the socket into a precisionized position relative to the scale when the index mates therewith.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view of a form of miter-box provided with the present improvement. Fig. 2 is a front view thereof, partly broken away. Fig. 3 is a side view, partly in central cross-section and on an enlarged scale. Fig. 4 shows a side view of the index-pin or locking-bolt and eccentric bushing. Fig. 4ª shows a front view thereof, and Fig. 5 is a horizontal section through the same and its surrounding parts.

The frame shown herein for the purpose of illustration comprises a base portion or bottom plate 6, supported by feet 7 and having a back 8 rising from the base, through which back a saw-opening 9 is shown, having beveled edges 10. A beam-arm 11 is pivoted to the under side of the bottom plate 6 and carries at each end a saw-guide 12, each of the saw-guides in the present instance having a base portion or block 13 entering sockets 14 upon the beam. Two of such sockets are shown for the front guide and between which it is exchangeable. At the front part of the base of the machine is shown an apron 15, projecting therefrom and provided with a series of bolt-holes or index-pin notches 16, which will indicate the various positions at which miters or bevels are generally made upon work ordinarily in practice and will in coöperation with a bolt or pin locate the guides at the proper positions. The front of the apron is provided with a segmental guide-face 17, upon which a lip 18 of a block 19 may travel, and which block is fastened by a screw 20 to the arm and serves to assist in sustaining the beam and removing part of the strain from its pivot.

An index-pin or bolt 21 is provided for entrance into the notches or recesses 16 and is shown as carried by a body portion 22, mounted in and having a close working fit in a bushing 23, the bore 24 of which bushing is eccentric to its perimeter 25. The bolt has a reduced stem 26 projecting out of the bushing, a reduced portion 27 upon the inside of the bushing guiding the stem and forming a support for a spring 28, interposed between such reduced portion and the body portion of the bolt. The perimeter 25 of the bushing has a working fit with the socket 29 in the beam. The sides of the bushing are cut away at 30, leaving a rib 31 between such cut-away portions forming a bearing for suitable set-screws 32, which may have reduced ends 33, provided with rounding faces 34 at their ends of engagement with the rib 31. The bolt may have a recess 35 in its reduced end to receive the end 36 of an actuating-lever 37, pivoted to a bracket 38 upon the beam, whereby the bolt may be withdrawn from its work.

When it is desired to precisionize the beam-arm relatively to the bolt-notches, it will simply be necessary to loosen one of the screws 32 and tighten the other, whereby the bushing is turned in its socket and the bolt or index-pin given a certain amount of angular movement laterally of its normal position, (see dotted lines, Fig. 5,) whereby errors in the construction of the parts of the device may be compensated for. In assembling the screws 32 entering the recesses in the bushing will bring it to its proper longitudinal position and hold it there while the bushing is being brought by the same screws to proper angular position. Generally in the manufacture of the miter-box the bolt-holes will be controlled as to position by a jig, so that if the faces for positioning the jig are at all erroneous all the bolt-holes will have the same amount of error, which can be compensated for by a change of position of the bolt. The change of this one part will control and precisionize the position of the beam relatively to the bolt-holes irrespective of the number of such holes. The precisionizing of the beam will precisionize the saw-guides carried thereby, so that the cut of the saw will be at the exact angle from the work-positioning portions of the frame when the index-pin or bolt engages the notch provided for such position or angle. The statement that the beam is precisionized of course means not the beam irrespective of the tools carried thereby, but that the work of the beam is rendered exact.

The pin herein is illustrated as mounted in an eccentric bore of a bushing; but it will be apparent that the index-pin in some structures may be eccentrically disposed on its body portion, which may afford bearing-faces for the adjusting members.

The structural element herein referred to as an "index-pin or bolt" may of course have a different form from that illustrated, as may also most of the other parts of the device.

The truss-frame herein shown is claimed in my copending application, Serial No. 175,425, filed October 2, 1903.

Having described my invention, I claim—

1. The combination with a frame having work-positioning members and a beam carrying tool-guides swiveled thereto, of a series of index-recesses in the frame; a socket in the beam; an eccentric bushing mounted in said socket and having a working fit therewith; a pin carried within the bushing; and means to rotate the bushing upon its center to change

the position of the index-pin and secure the same in such position.

2. In a miter-box, the combination with a frame, of a beam-arm swiveled thereto, saw-guides carried by the beam-arm; bolt-recesses in the frame; a socket in the beam-arm; a bushing mounted in and having a working fit with the socket and having its internal bore eccentric to its perimeter; a bolt for said recesses in and having a working fit with the internal bore of said bushing; and means to rotate the bushing within its socket to move the bolt and to secure the bushing in its rotated position.

3. The combination with a frame having work-positioning members, of a beam swiveled thereto; tool-guides carried by the beam; a series of index-pin holes in the frame; an eccentric bushing; an index-pin carried by the bushing; and a pair of set-screws engaging the bushing from opposite sides to rotate the bushing upon its center and change the position of the pin.

4. In a miter-box the combination with a frame, of a beam-arm swiveled thereto; saw-guides carried by the beam-arm; a series of bolt-recesses on the frame; a socket in the beam-arm; a bushing mounted in and having a working fit with the socket and having its internal bore eccentric to its perimeter; a bolt having a working fit with said internal bore; and means to turn the bushing within its socket and to lock the same against rotation.

5. The combination with a frame having work-positioning members, of a beam swiveled thereto; tool-guides carried by the beam; a series of index-pin holes in the frame; a socket in the beam; a bushing having an eccentric bore carried by said socket; an index-pin mounted in said bore; a pair of recesses on one side of the bushing extending inwardly from opposite sides and leaving a rib therebetween; a screw-threaded hole in each side of the beam transversely disposed to the socket and both entering the socket at one side and on a line with the recesses in the bushing; and set-screws in said holes organized to enter the recesses and bear upon the rib.

6. The combination with a frame having work-positioning members, of a beam swiveled thereto; tool-guides carried by the beam; index-recesses on the frame; a socket in the beam; a bushing having an eccentric bore carried by said socket; an index mounted in said bore; a pair of recesses on one side of the bushing projecting inwardly from opposite sides and leaving a rib therebetween; a screw-threaded hole in each side of the beam transversely disposed to the socket and both entering the socket at one side and on a line with the recesses in the bushing; and set-screws in said holes organized to enter the recesses and bear upon the rib.

7. In a miter-box the combination with a frame, of a part movably connected thereto; saw-guides carried thereby; an index-scale on one of them; a socket in one of them; a bushing having an eccentric bore mounted in the socket; an index in said bore; oppositely-disposed tangential recesses in one side of the bushing with a rib therebetween; screw-threaded holes leading into one side of the socket at the region of the recesses in the bushing when the parts are assembled; pins having screws to mate with the threaded holes to fit the recesses and locate the bushing longitudinally and to bear on the rib and locate the same angularly.

8. The combination with a frame having work-positioning members and a beam carrying tool-guides swiveled thereto, of a series of index-recesses in the frame; an eccentric bushing; an index-pin carried by the bushing; and screws engaging the bushing from opposite sides to rotate the same upon its center and change the position of the index.

9. In a miter-box the combination with a frame having work-positioning portions and a tool-guide-carrying beam swiveled thereto, of a series of index-notches in the frame; an eccentric bushing; an index carried by the bushing; and screws active upon opposite sides of the bushing to rotate the same upon its center and change the position of the index.

10. The combination with a frame, of a beam-arm swiveled thereto; saw-guides carried by the beam-arm; a series of index-notches on the frame; a socket in the beam; a bushing mounted in and having a working fit with the socket and having an internal bore eccentric to its perimeter; an index having a working fit with said internal bore; and means embodying a screw to turn the bushing within its socket and to lock the same against rotation.

Signed this 19th day of September, 1903, at Nos. 9 to 15 Murray street, New York, N. Y.

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Witnesses:

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