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MECHANIC'S TOOL

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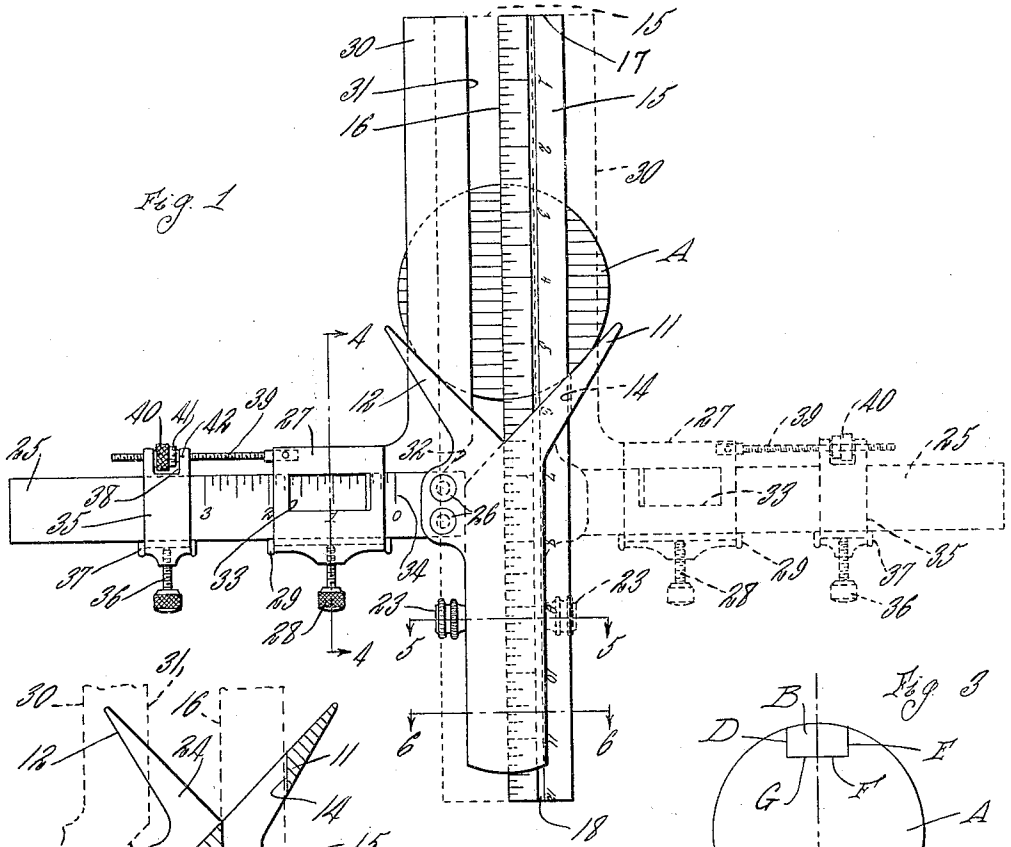


Fig. 1

Fig. 2

Fig. 3

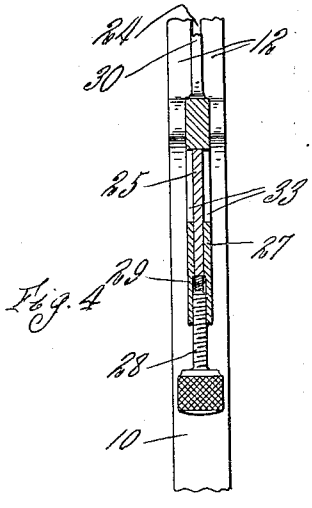


Fig. 4

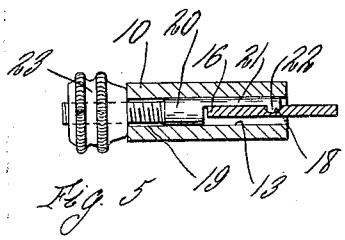


Fig. 5

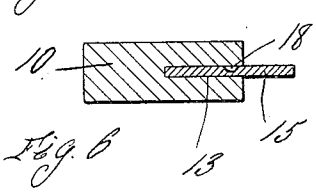


Fig. 6

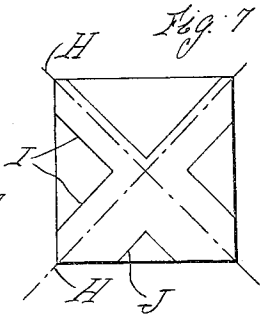


Fig. 7

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UNITED STATES PATENT OFFICE

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MECHANIC'S TOOL

Application filed July 1, 1932. Serial No. 620,470.

This invention relates to mechanics' tools of the type sometimes known as delineators or gauges, and is particularly useful for laying out work and for use as calipers.

An object of the invention is to provide an improved mechanic's tool by the use of which key ways and other shapes may be laid out upon bars or other objects, in a simple and rapid manner and with a maximum of accuracy; with which the necessary adjustments for different types of layout work may be quickly and easily made; and which will be light in weight, convenient in use, and simple, compact and inexpensive in construction.

Another object of the invention is to provide an improved mechanic's tool which may be used for laying out various types of work, and which also may be used as calipers to measure diameters and dimensions of various objects.

Another object of the invention is to provide an improved, simple and practical combination calipers and gauge, which will have a maximum of uses, and will be simple and convenient to manipulate.

Various other objects and advantages will be apparent from the following description of one embodiment of the invention, and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawing:

Fig. 1 is a front elevation of a mechanic's tool constructed in accordance with this invention, and illustrating by dash lines a second operative position for the tool when the tool is used in laying out a key way on a shaft;

Fig. 2 is a sectional elevation of one end of the tool with certain parts removed, the section being taken parallel to the projection plane in Fig. 1 at the forked end of the tool;

Fig. 3 is a diagram illustrating the manner in which a key way is laid out on the end of a round shaft by the use of this tool;

Fig. 4 is a sectional elevation of a part of the tool, the section being taken approximately along the line 4—4, Fig. 1;

Fig. 5 is a sectional plan through a part of the tool, the section being taken approximately along the line 5—5 of Fig. 1;

Fig. 6 is a sectional plan through another part of the tool, the section being taken approximately along the line 6—6 of Fig. 1; and

Fig. 7 is a diagram illustrating still another use for this combination tool in accordance with this invention.

In the illustrated embodiment of the invention, the improved tool includes a flat, plate-like handle or base part 10 which is forked at one end, with the arms 11 and 12 of the fork diverging from one another at their junction with the body of the handle, and preferably subtending between them an angle of 90°. This handle 10 is provided, along one side edge, with a slot 13 which extends from end to end of the handle and through one of the arms at the forked end, such as the arm 11. The extension of the slot through the arm 11 may be by means of an aperture 14, Fig. 2.

A scale strip or bar 15 is disposed in the slot 13 and is adjustable endwise along the same, so as to project different distances across the angle between the arms at the forked end. The inner edge 16 of this scale strip or bar 15 bisects the angle between the arms 11 and 12 at all times, even though it moves endwise along the handle member 10. The scale bar is in the nature of a rectangular strip or plate of uniform width between its side edges, and the inner edge of the slot 13 passes through the apex of the angle between the arms 11 and 12. The end edge 17 of the scale bar 15 which projects beyond the arms 11 and 12, runs at right angles to the edge 16, which bisects the angle between the arms 11 and 12, for a purpose that will appear shortly.

Suitable means is provided for securing or clamping the scale bar 15 releasably in different adjustable positions along the slot 13 of the handle member 10. For example, the scale bar may have a groove 18 running endwise thereof in one face thereof and the handle member is provided with a passage 19, Fig. 5, extending from edge to edge there-

of at a point intermediate the ends of the handle member. A stud 20, Fig. 5, is disposed for endwise movement in said passage, and at the end which projects into the groove 13 is provided with a reduced extension 21, terminating in a hook 22 which runs in the groove 18 of the scale strip or bar 15.

The other end of the stud 20 is threaded and projects outwardly at that edge of the handle or member 10 which is opposite from the groove 13, and carries a nut 23 which is threaded thereon and engages with a side edge of the handle member. By tightening the nut 23, the scale strip or bar 15 will be drawn tightly against the bottom of the groove 13 and thus locked releasably against endwise movement in the handle or member 10. The arm 12 is slotted intermediate its faces from its free end to its junction with the body of the handle member, the slot being designated by the reference 24 in Fig. 2. The slot 24 is also extended, (Fig. 2), down that edge of the handle member 10 which is opposite the groove 13.

In this extension of the slot 24, a third arm or support 25 is disposed and secured in any suitable manner, such as by rivets or screws 26 (Fig. 1) which pass through the arm or support 25 and the slotted portion of the handle. This arm or support 25 extends laterally from the handle so that it really functions as a part of the handle, and preferably is at right angles to the angle-bisecting edge of the scale bar 15. A runner 27, Fig. 1, is mounted upon the arm or support 25 for movement therealong toward and from the body of the handle or member 10. A set screw 28 carried by the runner serves to clamp it, in any adjusted position, to the arm or support 25. For this purpose, the inner end of the screw may engage a strip or bar 29 which is disposed between an edge of the arm 25 and the adjacent edge of the runner, so that when the screw 28 is tightened or threaded in one direction, it will force the bar 29 tightly against an edge of the arm 25 and lock the runner frictionally against movement in either direction.

The runner 27 carries a plate-like lateral extension 30, which preferably is in the plane of the scale bar 15, that moves toward and from the bar 15 when the runner 27 is adjusted along the arm 25. The edge 31 of this lateral extension which is nearest the scale bar 15, is parallel to the angle-bisecting edge of the scale bar 15. This lateral extension 30 moves through the slot 24 during its approach toward, or recession from, the scale bar and if necessary, the lateral extension is bevelled off as at 32 at its inner end, so as to conform to the shape of the adjacent part of the slot 24 and enable movement of the lateral extension into contact with the edge 16 of the scale bar.

The runner is provided with a window 33 in each face thereof, and one end of each window, such as the right hand end shown in full lines in Fig. 1, may be utilized as a reference line or marking in cooperation with scale graduations 34 provided on the adjacent face of the arm or support 25. The cooperating graduations or marks on the runner 27 and the arm 25 are preferably so chosen as to indicate directly the distance between the edges 16 and 31 of the bar 15 and lateral extension 30 respectively, at all times.

If desired, a vernier attachment may be provided for the runner and for this purpose, an auxiliary runner 35 may be provided on the arm 25 and secured or clamped against movement by a screw 36 and strip or bar 37 which are similar to the screw 28 and bar or strip 29 of the main runner 27. The auxiliary runner 35 is provided at one edge with a notch 38, and a threaded rod 39 extends through aligned apertures at opposite sides of the slot 38. One end of the threaded rod 39 is pivotally attached to the runner 27.

The rod 39 carries a nut 40 which is disposed in the notch 38 of the auxiliary runner, so that when the nut 40 is rotated, it will, by its engagement with the ends of the notch 38, shift the rod 29 endwise therethrough and relatively to the auxiliary runner. Thus if the auxiliary runner is clamped to the arm 25 and the screw 28 of the main runner 27 is released, a rotation of the nut 40 will produce a vernier or slow motion movement of the main runner 27. The nut 40 may be provided, on its periphery, at one end with scale graduations 41 which cooperate with a reference scale indicator or mark 42 provided on the auxiliary runner at one end of the notch 38, so as to constitute a vernier scale relating to the movement of the main runner 27 and thus supplementing the scale provided on the arm 25.

One of the many uses for this improved tool is the laying out of a key way at one end of a cylindrical shaft or body, such as the body A in Figs. 1 and 3. Assuming that it is desirable to lay out a key way B at the end of this body A, the tool is applied to the body A, as shown in Fig. 1, with the diverging arms 11 and 12 extending in opposite directions along the circular periphery of the body A. In other words, the arms 11 and 12 straddle the body A in a peripheral direction, and since the edge 16 always bisects the angle between the arms 11 and 12, the edge 16 will always represent a diameter of the body A regardless of the movement of the improved tool around the periphery of the body A while in contact therewith.

With the improved tool applied to the body A, as shown in Fig. 1, the mechanic takes a suitable marking tool or scribe (not shown) and lays out a diameter on the end of the body A by marking a line on the body

A along the edge 16 while the tool is held against the body A in the manner shown in Fig. 1. The mechanic adjusts the runner 27 until the edge 31 of the lateral extension 30 of the runner is at a distance from the edge 16 corresponding to half the width of the key way to be laid out. The runner 27 is then clamped in this position, as shown in Fig. 1, and with the edge 16 still along the center line C, Fig. 3, which was laid out on the end of the body A, the mechanic marks with his scribe the line D in Fig. 3.

The mechanic then removes the tool from the body A, turns it about the axis of the handle through approximately a half revolution and reapplies it to the end of the body A, as shown by the dash lines in Fig. 1. The edge 16 still will run along a diameter of the body A, and the tool is shifted peripherally about the body A, if necessary, until the edge 16 coincides or is aligned with the center line C which was just previously laid out upon the end of the body A. When this is done, the tool is held in that position and the scribe moved along the edge 31 so as to mark the line E in Fig. 3.

The mechanic then loosens the nut 23 so as to release the scale bar 15, and the latter is then shifted downwardly until its end edge 17 overlies the area of the end of body A in a position representing the desired depth of the key way B. The screw 23 is then tightened and thereupon the mechanic draws his scribe along the edge 17 and marks the line F in Fig. 3. The mechanic then returns the tool to the position shown in full lines in Fig. 1, again brings the edge 16 into alignment with the center line C, and then draws his scribe along the end edge 17 to mark the line G in Fig. 3, which is a continuation of the line F. This completes the layout of this keyway by use of this tool.

It will be noted that by the use of the bisecting edge 16 for aligning the tool on the same diameter, the lines D and E, which were laid out on the end of the body A, will be exactly parallel to one another and to the diameter or center line C. The keyway is always centered on the diameter or center line C without special effort or attention on the part of the operator.

The tool is also useful in forming V bars, that is, bars having V-shaped grooves in the faces thereof. To make such a V bar, a strip of bar which is rectangular or square in cross section, Fig. 7, is selected and the tool applied to the end of this square bar at a corner thereof with the arms 11 and 12 extending along intersecting faces or sides of the bar. The mechanic will then lay out or mark one of the center lines, such as H in Fig. 7.

The runner 27 is adjusted or set to provide a distance between the edges 16 and 31 which is equal to the distance desired between the center line H and one of the faces of the V to be formed, such as along the line I in Fig. 7. While the tool is applied in this position with the edge 16 along the center line H, the mechanic draws his scribe or marking tool along the edge 31 and lays out a line corresponding to the line I in Fig. 7.

The tool is then reversed face to face, with the edge 16 along the same center line H and the runner 27 again adjusted to place the edge 31 at a distance from the edge 16 corresponding to the desired distance between the center line H in Fig. 7 and the line J which represents a face of the V in another face of the block. Similarly, the tool is applied to each of the corners of the block or body, and the other center line and its related lines representing the faces of the V's in the other faces of the block are laid out, as shown in Fig. 7.

The tool may also be used as calipers to measure the diameter of any body merely by adjusting the runner 27 until the edges 16 and 31 just touch opposite faces or sides of the body whose diameter or dimension is to be ascertained. The reading on the scale 34 of the arm 25 will then indicate directly the diameter of the body between the points of contact of the body with the edges 16 and 31.

Various other examples of the use of such a tool might be given, such as the laying out of hexagon or square heads intended as a reduced extension of a body, but an enumeration of all the uses to which the improved tool may be put would serve no useful purpose and is omitted in the interest of brevity.

It will be understood that various changes in the details and arrangement of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as explained in the appended claims.

I claim:

1. A mechanic's tool comprising a handle member with diverging arms to straddle in a peripheral direction, members of different diameters, a centering element having an edge bisecting the angle between said arms, and an offset element carried by said handle member and having an edge also extending across the angle between said arms and parallel to said edge of said centering element, said offset element being adjustable on said base handle member to carry its edge toward and from said edge of the centering element.

2. A mechanic's tool comprising a handle having diverging arms at one end, a strip mounted in said handle to slide endwise thereof and project endwise through one of said arms at one end of the handle, with one edge of said strip bisecting the angle between said arms, the projecting end of said strip being at right angles to the edge bisecting the angle between said arms, means carried by

said handle for clamping said strip in different adjusted positions, an arm extending laterally from said handle at the side edge opposite said strip, means mounted on said laterally extending arm for movement toward and from said handle and having a lateral extension running approximately parallel to said strip and having its side edge nearest the handle parallel to the angle-bisecting edge of said strip, the diverging arm at the side edge from which said laterally extending arm extends being slotted in a direction from end to end to permit movement of said lateral extension into and out of contact with said strip.

3. A mechanic's tool comprising a handle having diverging arms at one end, a strip mounted in said handle to slide endwise thereof and project endwise through one of said arms at one end of the handle, with one edge of said strip bisecting the angle between said arms, the projecting end of said strip being at right angles to the edge bisecting the angle between said arms, means carried by said handle for clamping said strip in different adjusted positions, an arm extending laterally from said handle at the side edge opposite said strip, a runner sliding endwise on said laterally extending arm for movement toward and from said handle, a lateral extension carried by said runner and having its edge nearest said strip disposed parallel to said strip, said runner and laterally extending arm having cooperating graduations and reference lines by which the distance between said lateral extension and the angle bisecting edge of said strip may be directly indicated.

4. A mechanic's tool comprising an elongated handle having at one end a pair of arms diverging in a direction away from the handle and endwise thereof, said handle having a slot along one edge and through one of said arms, a bar disposed in said slot and shiftable endwise of itself along said slot so as to project endwise from said handle beyond said arms to different extents, means for clamping said bar in different adjusted positions, one edge of said bar bisecting the angle between said arms, a runner arm extending laterally of said handle adjacent said diverging arms and at the side of said handle opposite from said slot, a runner adjustable on said runner arm for movement toward and from the handle and having a lateral extension movable therewith, with the edge of the extension nearest the handle running parallel to the angle-bisecting edge of said scale bar, the diverging arm of the handle at the side from which the runner arm projects being slotted intermediate its faces to enable movement of said lateral extension into contact with the angle-bisecting edge of said bar, the end of said bar which projects beyond said diverging arms running in a direction at 90° to the angle-bisecting edge of said bar.

5. A mechanic's tool comprising an elongated bar terminating at one end in two diverging arms subtending between them an angle of 90°, said bar having a slot along one side edge from end to end, and through one of said arms, and having a slot in the other arm intermediate its faces and from the outer end approximately to the junction between the diverging arms, a bar slidable in said first slot and running endwise along said handle so as to project beyond said arms, means for securing said bar releasably in different positions, the end of said bar which projects beyond said arms being at right angles to the inner edge of said bar, and the inner edge of said bar being straight and bisecting the angle subtended between said arms, a third arm on said handle and extending laterally therefrom at the side opposite said bar, runner means mounted on said third arm, adjustable thereon toward and from said handle and having a lateral extension shiftable through the slot in said other diverging arm toward and from said bar as said runner means is shifted along said third arm, the edge of said lateral extension nearest said bar being parallel to the angle bisecting edge of said bar, said runner means and third arm having cooperating scale indications and marks by which the distance between said lateral extension and said bar may be directly indicated at all times.

6. A mechanic's tool comprising a handle member having arms which diverge outwardly and away from the handle, a bar mounted on said handle between the faces thereof for movement endwise of the handle, so as to project different extents beyond the forked end, one edge of said bar bisecting the angle between said arms and the end of said bar, which projects beyond said forked end of the handle, being at right angles to the angle bisecting edge, and an offset element also mounted on said handle for movement toward and from said bar and having its edge nearest said bar running parallel to the angle-bisecting edge of said bar, and adjustable to different extents across the angle between said arms as it moves toward and from said bar.

7. A mechanic's tool comprising a plate-like handle terminating at one end in outwardly diverging arms, with the arms extending from the side edges of said member, said handle being slotted along opposite side edges in a direction end to end and through said arms, a bar disposed in the slot along one of said edges and adjustable therein to project different distances beyond said arms at that end of said member and having its inner edge bisecting the angle between said arms, a third arm extending at one end into the slot at the opposite edge of said handle

and secured thereto so as to extend edgewise from said handle, a runner carried by said last named arm and having a lateral, plate-like extension which projects approximately parallel to said bar, with its edge that is nearest said bar running parallel with the angle bisecting edge of said bar, said lateral extension moving through a slot in one of the diverging arms as it approaches and recedes from said bar, said runner and third arm having cooperating scale indications and marks by which the distance between the adjacent edges of said lateral extension and bar at any time may be directly indicated.

8. A mechanic's tool comprising a handle having diverging jaws, a member having an edge bisecting the angle subtended by said jaws, and a second member mounted on said handle for adjustment in a direction transversely to said bisecting edge and having an edge parallel to said bisecting edge.

9. A mechanic's tool comprising a handle part having diverging jaws, a member having an edge bisecting the angle subtended by said jaws and mounted on said handle part for endwise movement parallel to said edge, means for clamping said member in different adjusted positions, the end portion of said member which projects away from the apex of said angle and across said angle terminating in an end edge at a right angle to said bisecting edge, and a second member mounted on said handle part for movement in a direction parallel to said end edge and having an edge parallel to said bisecting edge of said first member.

10. A mechanic's tool comprising a handle having diverging jaws which subtend between them an angle of 90°, a member having an edge bisecting the angle subtended by said jaws, and a second member mounted on said handle for adjustment in a direction transversely to said bisecting edge and having an edge parallel to said bisecting edge.

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