April 6, 1948. J. F. KELLEM 2,439,008

DRILL STAND AND GAUGE

Filed June 5, 1945

Fig. 1.

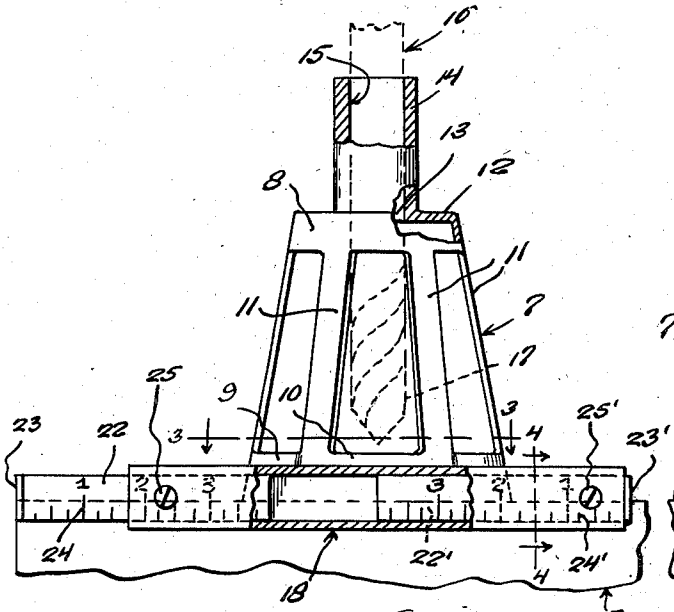


Fig. 2.

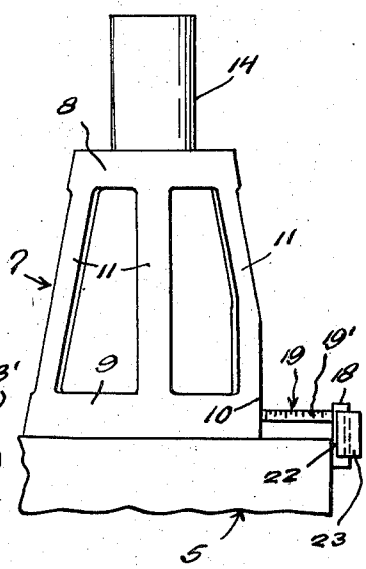


Fig. 3.

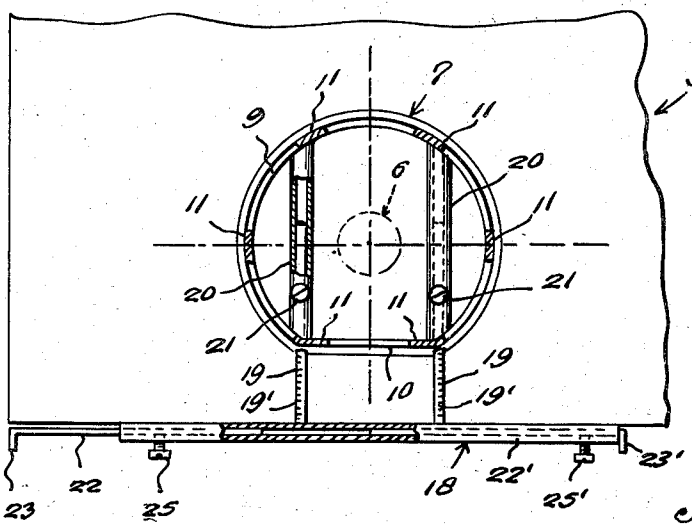
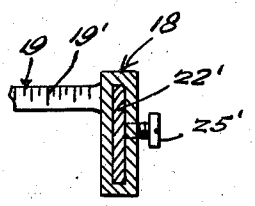


Fig. 4.



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DRILL STAND AND GAUGE

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3 Claims. (Cl. 77—62)

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This invention relates to adjustable drill stands, holding and manipulating devices and the like, and more particularly to a gauge attachment for such devices to enable the operator to ascertain the proper location of the device in the boring of one or more holes in a piece of work at certain predetermined distances apart in a direction either from the edge of the piece of work or from hole to hole.

An object of the invention is to improve generally upon devices of this kind and at the same time simplify the construction not only to minimize the cost of production but to also facilitate the adjustment of the device and its application to the work in a practical and efficient manner.

Other objects and advantages to be attained will hereinafter more fully appear in the following description.

A practical but non-limiting exemplification of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevational view of the device applied to the work with parts of the device shown in section;

Figure 2 is a view taken at right angles to the showing in Figure 1;

Figure 3 is a partial plan view and horizontal section on the line 3—3 of Figure 1; and

Figure 4 is a fragmentary sectional view of one of the gauge members of the device taken on or about the line 4—4 of Figure 1.

Referring now to the drawings in detail, the numeral 5 designates, generally, a piece of work in which is to be bored a hole or a multiplicity of holes, one of which holes is indicated by the circular dotted line and designated by the numeral 6 in the fragmentary, corner, face view of the piece of work as shown in Figure 3. In this connection, while the present invention is not absolutely limited thereto, the device of the invention is primarily and more particularly intended and adapted for use in boring a large number of holes in a piece of work in ship building and the like. That is to say, either in timbers or large sheets of material, such as, for example, in floor coverings of "flat tops" which is the common terminology for airplane carriers and the like. Anyway, in work where there is required a large number of holes definitely located with respect to the margin of the piece of work or from hole to hole.

The device of the present invention has to do more particularly with the gauging of the location of holes to be bored and in its application it is not limited to any one particular form and arrangement of drill stand or manipulating element for the boring tool.

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For the purpose of illustration of the present invention, the gauging device is attached to a substantially frusto-conical, open, cage-like type of stand or element 7. As shown, the element 7 has a circular top portion or annulus 8 and a base portion 9 of somewhat larger diameter. The lower portion 9 is generally circular throughout the major portion thereof but one side thereof is flattened, as at 10. The annular top portion 8 and base portion 9 are connected by longitudinal bars or narrow plates 11, thus making the element 7 cage-like and in the form of a hollow, open-sided, truncated cone.

In the form shown, the cage-like element 7 has six of the longitudinal bars or narrow plates 11 and, of course, six relatively large openings between the members 11 so as to afford ample sized sight openings for observation of the adjacent end portion of a drill bit inserted and supported in the element 7 as will be presently described more fully in detail and also to observe the adjacent surface portion of the work where the hole is to be bored. As above indicated, this element 7 may be varied in size and form, as far as the present invention is concerned, but, in any case, the same must be of ample rigidity and have ample sight opening therein for the purposes of the present invention.

Formed integrally or otherwise suitably provided at the upper end of the cage-like element 7 is an end plate 12 having a central opening 13 therein (see Figure 1) and extending upwardly from said end wall or plate 12, and annularly coincident with the edge of the opening 13 is a tubular member 14 which may be either formed integrally with the wall or plate 12 or otherwise rigidly attached thereto at its inner end. The tubular extension 14 of the end wall or plate 12 of the element 7 may be made in any desirable length, but, in any case, the length should be sufficient to afford ample longitudinal bearing surface for a drill bit which is inserted freely movable and longitudinally slidable in the bore of said tubular extension 14. As indicated in Figure 1, the bore 15 of said tubular extension 14 of the cage-like stand or holding and manipulating element 7 is of a diameter corresponding to the major outside diameter of the drill bit which is shown in dotted lines and designated by the numeral 16. In the general use of devices of this kind, the element 7 is utilized as a manually manipulable stand or holding and guiding device for the drill bit and said element 7, in use, rests slidably at its lower end on the face of a piece of

work to be bored, where it may be manipulated by hand to different desired positions on the piece of work, and before the drilling operation is started the lower end portion 17 of the drill bit 16 is, of course, in a slightly raised position above the surface of the work. Then, with the element 7 properly positioned and usually held in place by one hand of the operator, the drill bit is operated under the control of the operator by the use of his other hand, or, in some cases, where the drill bit is provided, arranged and adapted for operation without manipulation of one of the operator's hands, the operator may then use both hands in adjusting the element 7 into position and there holding it for the operation of boring.

The gauge attachment of the present invention is attached to the lower base portion of the element 7 at one side thereof. In the application of the gauge attachment of the present invention to the cage-like element 7, particularly in the exemplification illustrated in the drawings, the gauge attachment is applied to the flattened side portion 10 of the annular base member 9 of the element 7. This particular flattening formation 10 at one side of the base of the element 7 is made more especially to facilitate the use of the device for the boring of a hole in the piece of work at a minimum distance from the adjacent margin of the work. That is to say, in one adjustment of the gauge attachment the same is laterally of the base portion of the element 7 and for an outward adjustment of the attachment, for a larger dimension, a continuous circular formation of the base portion 9 would suffice, but, for adjustment inwardly to bore a hole in the piece of work at a desired minimum distance from the adjacent margin of the work, the continuous circular base formation of the element 7 would not permit sufficient inward adjustment of the gauge attachment for this particular purpose. Therefore, the flattening of the base portion 9, as at 10, permits an increased movement of the gauge attachment inwardly towards the axis of the device, and, obviously, this flattening formation of the base portion 10 may be varied to a considerable extent in different adaptations of the invention, that is to say, the flattening of the base member 9 may be made so as to bring the part 10 closer to the axis of the device, whereby the form of the base portion 9 may be nearly or substantially semi-circular rather than more nearly of a complete circular form, just so as there is sufficient internal clearance in the element 7 for the working of the drill bit.

As shown, the gauge attachment comprises an elongated body member which may be of any suitable cross sectional form. As shown more clearly in Figure 4, the body member 18 is of a tubular form and of a rectangular cross section. The body member 18 is provided at opposite sides of its middle with a pair of spaced-apart, perpendicular leg extensions 19 which are slidably fitted in tubular holding and guide members 20 rigidly attached to the base portion 9 of the element 7 and extending chordwise thereacross in parallel relation to each other (see Figure 3). To releasably hold the leg members 19 of the body member 18 in different longitudinally adjusted positions in the supporting and holding members 20, set screws 21 or other suitable releasable holding means are provided on the tubular members 20. So, too, the leg members 19 may be provided with suitable transverse markings 19' to indicate the distance the body member 18 may be adjusted with relation to the axis of the element 7, and, of course, also with relation to the axis of the drill bit 16 which is coincident with the axis of the element 7.

Slidably fitted in the opposite end portions of the body member 18 is an opposed pair of adjustable gauge plates 22, 22'. As shown, the plates 22, 22' are plain flat plates of transverse dimensions corresponding to the rectangular opening in the tubular body member 18, the fitting of the members 22, 22' in the member 18 being, for practical purposes, preferably relatively tight so as to permit the members 22, 22' to be moved endwise in the member 18 yet the same are frictionally held in place.

In the closed positions of the members 22, 22' their inner ends meet coincident with a transverse medial line between the opposite ends of the member 18 and each of the members 22, 22' are individually adjustable outward and inward in their respective receiving portions of the member 18.

Any suitable means may be provided for conveniently grasping the outer end portions of the members 22, 22', but, as shown, they are provided with plain right angular end extensions 23, 23' respectively. The members 22, 22' are provided with graduations or scale markings 24, 24', respectively, which markings 24, 24' are readable in connection with the adjacent end portions of the tubular body member 18, it being understood that these markings on the slide members 22, 22' are determined in relation to the medial line between the ends of the member 18, which medial line is also coincident transversely with respect to the axis of the element 7 of the device, just as the markings 19' on the leg members 19 of the body member 18 are coincident with the axis of the device but spaced apart and laterally therefrom.

The slide members 22, 22' may be without any fastening means and friction alone depended upon to retain them in their longitudinally adjusted positions. As shown, however, the tubular straight edge body member 18 is provided near its opposite ends with set-screws 25, 25' arranged and adapted to be tightened against said slide members 22, 22', respectively, to hold them releasably in place.

It is further noted that, preferably, the leg extensions 19 of the body member 18 are from the inner face of the member 18 adjacent the top edge portion thereof. By this form and arrangement the major body portion of the member 18 depends considerably downward from the supporting legs 19 so that the member 18 functions as a straight-edge and guide flange which is brought abuttingly against the adjacent edge portion of the piece of work in setting the device in place for the boring of a hole in the work relative to its edge portion. By this provision and arrangement, it is readily seen that the adjustment is accomplished easily and with facility in positioning the element 7 of the device for the boring of a hole at a desired position on the piece of work. That is to say, the adjustment of the straight-edge or guide flange portion 18 of the device laterally with relation to the axis and placing the member 18 against the edge of the piece of work gives the proper lateral positioning of the device and by sliding the member 18 along the edge portion and having extended the outer end portion of the slide member 22 or 22', as the case may be, if necessary, the positioning of the element 7 longitudinally from the adjacent end of the piece of work or from hole to hole is quick-

ly and accurately accomplished by the operator (for example, see Figure 3).

The foregoing are explanations of only a few practical angular applications of the device to a piece of work and it is to be understood that other ways of applying and using the device are feasible and practical. That is to say, the member 18 or straight-edge member of the device may have its leg portions 19 withdrawn entirely from the supporting and guide members 20, the member 18 reversed so that its major body portion projects upwardly from its leg members instead of depending downwardly therefrom to function as a stop and guide flange as shown in the drawings, in which reverse position of the member 18 the leg members 19 are reinserted in the supporting and guide members 20 so that the base portion 9 of the element 7 may rest endwise on the surface to be bored and accordingly moved slidably across the same, at will, which movement is permitted because the gauge member 18 is supported at an elevation freely above and clear of the face of the work.

The illustrated exemplification of the invention is but one practical adaptation and embodiment. Hence the same admits of considerable modification without departing from the spirit and scope of the invention as defined by the appended claims. Therefore, the invention is not limited to the specific construction and arrangement shown.

What is claimed is:

1. In a guiding and holding device for drills and the like, a cage-like stand for guiding the drill toward the work, a gauge attachment telescopically related to the stand for movement at right angles to the axis of the drill and including a body member extending at right angles to the direction of movement and having means for engaging the edge of the work, and a pair of gauge plates each telescopically related to the body member and movable toward or from one another.

2. In a guiding and holding device for drills and the like, a cage-like stand for guiding the drill toward the work and also including parallel guide means, a gauge attachment telescopically related to the guide means for movement at right angles to the axis of the drill and including a body member extending at right angles to the direction of movement and having means for engaging the edge of the work, and a pair of gauge plates each telescopically related to the body member and movable toward or from one another.

3. In a guiding and holding device for drills and the like, a cage-like stand for guiding the drill toward the work and having at its lower end a flat edge, a gauge attachment telescopically related to the stand for movement at right angles to the axis of the drill and including a body member extending at right angles to the direction of movement and parallel to the flat edge and having means for engaging the edge of the work, and a pair of gauge plates each telescopically related to the body member and movable toward or from one another.

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