This invention relates to a novel angularly adjustable device for supporting a work piece upon a machine while performing an angular drilling, milling, grinding or other operation upon said work piece.

More specifically, the invention relates to such a work supporting device having a U-shaped support frame and a U-shaped swing frame, the upstanding arms of said swing frame being pivoted to the corresponding arms of said support frame. The arm-connecting portion of the U-shaped support frame is mounted on a base, a work mounting plate is secured upon the arm-connecting portion of the swing frame, and means are provided for securing said swing frame to said support frame after setting of said swing frame in any desired angular position.

The principal object of the invention has been to provide a novel construction in which the support frame is detachably connected with the base, and in which the work mounting plate is detachably mounted on the swing frame. Thus, by detaching the base and the work mounting plate, the assembly of support frame and swing frame is readily useable as an assembly upon which to mount a diamond-point or other tool for use in the radius dressing of grinding wheels. Quite a saving in shop equipment may be thus effected as it is not necessary to have both a complete angularly adjustable work support and a complete radius dresser.

In attaining the above stated object, another object has been to provide a base of novel construction to rigidly yet detachably mount the support frame upon a machine which is to be used for performing an operation on a work piece secured to the work mounting plate.

A further object has been to provide a novel work mounting plate for rigid yet detachable connection with the swing frame.

A still further object has been to provide adjacent upstanding arms of the support frame and the swing frame as well as with coating lateral wings, to provide threaded fastening means for clamping said wings tightly together to lock the swing frame after adjustment thereof. And to make provision whereby at least the wing or wings of the support frame may be detached when the assembly of support frame and swing frame is to be employed for radius dressing.

Another object has been to make novel provision for detachably connecting a sine bar or the like with one of the pivot trunnions of the swing frame, for coaction with a Jo-block in setting said swing frame at a desired angle with respect to the support frame.

Still another object has been to provide the base with sine disks for use in setting said base in different angular positions.

Yet another object has been to provide a simple and inexpensive yet a durable and effective construction.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.
swing frame 21 into desired angular relation with said support frame 16.

Each wing 37 is formed with an attaching flange 42 at its inner end and slidably seated in a guideway 43 in the adjacent arm 17, for movement into and out of contact with the projecting wing 38. Each flange 42 has slots 44 through which screws 45 extend for securing the wing 37 to the support frame 16 in operative contact with the coating wing 38 of the swing frame 21 and for permitting shifting of said wing 37 from contact with said wing 38.

A sine bar 46 is provided for connection with either trunnion 23 for use in setting the swing frame 21 and plate 30 in any desired angular relation with respect to the support frame 16 and base plate 12. This sine bar has two downwardly projecting lugs 47 and 48 at its ends, respectively, and a sine disk 62 is attached to lug 48. A circular plate 51 is attached by screws 52 to one side of the lug 47 as best seen in Figure 4. This plate and lug have aligned openings 53, 54, and a supporting pin 55 extends through said openings and projects beyond the plate 51 for snug reception in the bore 28 of either of the trunnions 23, said pin 55 having a flange 56 secured by screws 57 to the lug 47. This lug and the plate 51 also carry two dowel pins 58 disposed on a diametrical line through the supporting pin 55. The dowel pins 58 project beyond the plate 51 and are located for reception in the openings 27 or 27a of either trunnion 23 when the supporting pin 55 is received in the trunnion bore 28. When angular adjustment of the swing frame 21 is to be made with the base plate 12 mounted in horizontal position and the work mounting plate 30 also horizontal, the dowel pins 58 are inserted into the openings 27 as seen in Figure 5. However, when such angular adjustment is to be done with the two plates 12 and 30 in vertical positions, the dowel pins 58 are inserted into the openings 27a. In either case the sine bar 46 may be horizontally positioned as seen in Figure 2. Then, a Jo-block 59 may be placed under the sine disk 49 and any required additional Jo-block may be inserted between said block 59 and said sine disk 49 to set the swing frame 21 in the desired angular position, in which position it is locked by tightening of the screws 41 and 45, the sine bar 46 being then removed.

It is preferable to provide a screw 60 (Figure 3) for locking the swing frame 21 against loose idle movement with respect to the support frame 16 while mounting the base plate 12 in any required upright or inclined position. The screw 60 extends through the arm 17 at one end of the support frame 16 and is receivable in a socket 61 in the adjacent end of the swing frame 21. A duplicate screw, for the same purpose, may well be provided at the other end of the frames 16 and 21.

To aid in setting the device when the base plate 12 must be mounted in different angular positions, sine disks 62 and 62a are detachably mounted at 63 upon said base plate.

While the sine bar 46 and the sine disks 49 and 62 are preferably employed to aid in accurately setting the device to mount a work piece in required position, simple settings may of course be accomplished with a protractor.

When the device is to be made ready for an angular setting, the base plate 12 may be placed on a horizontal supporting base as seen in Figure 2, with the screws 41 and 45 in a slightly loosened condition, and the measured Jo-block 59 is placed under the sine disk 49, thus initially setting the swing frame 21 in a vertical zero position. Now, assuming that the sine bar 46 is a five inch bar and that it is desired to tilt the swing frame 21 to an angular position of 14 degrees and 29 minutes, for which the sine of the angle is .25010 per inch, another Jo-block 1.25055" high must be inserted between the Jo-block 59 and the sine disk 49. The screws 41 and 45 are then tightened and the sine bar 46 is removed, leaving the device set at the desired height angle.
2,968,946

A holder for machine tools wherein the holder includes a frame member, a support member, a sine bar for accurately positioning said support member relative to said frame member, and connecting means removable therefrom permitting use of the latter in angularly setting said swing frame. The improvement residing in said connecting means which comprise a tubular trunnion fixedly secured to said support member and rotatably journaled in said frame member, said trunnion extending entirely through said frame member, said trunnion having a central bore and at least one radially offset socket, a sine bar supporting pin secured to said sine bar and projecting into said trunnion bore, and a sine bar positioning pin projecting into said socket.

The connecting means of claim 2 wherein said trunnion has an end flange abutting said frame member remote from said support member to limit movement of said support member relative to said frame member axially of said trunnion, and said socket is formed in said end flange.

In a holder for machine tools wherein the holder includes a supporting frame and a swing frame pivotally mounted within said supporting frame, said supporting frame having a pair of spaced upstanding arms and said swing frame having a pair of upstanding arms, trunnions on said swing frame arms received in said supporting frame arms, and connecting means on said swing frame arms for securing said swing frame in an adjusted angular position relative to said supporting frame; the improvement residing in said connecting means which comprise a pair of brackets secured to opposite sides of each of said supporting frame arms, each of said brackets including a mounting flange slidably seated in and secured to a respective one of said supporting frame arms and a segmental wing flange disposed parallel to the general plane of said one supporting frame arm, an arcuate slot through each wing flange with the axis of said trunnions as a center, a segmental wing on a side of each of said swing frame arms in opposed relation to said wing flanges, and a plurality of headed clamping fasteners carried by each of said wings and extending through the slot of a respective one of said swing flanges.

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