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2,564,720

OSCILLATING ATTACHMENT FOR ROTARY MACHINES

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2 Sheets-Sheet 1

FIG. 1

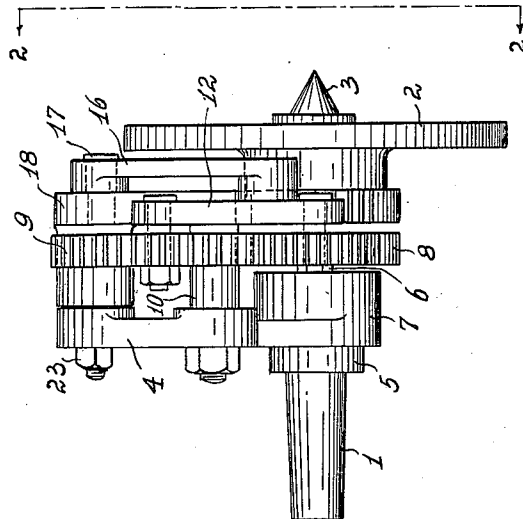
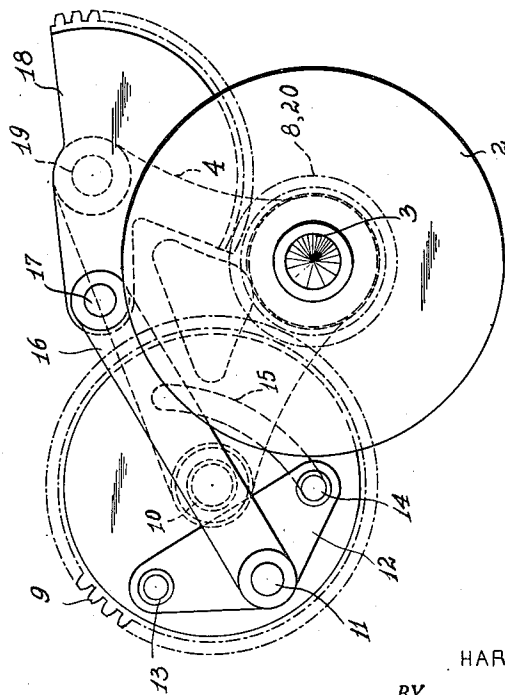


FIG. 2



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2 Sheets-Sheet 2

FIG. 3

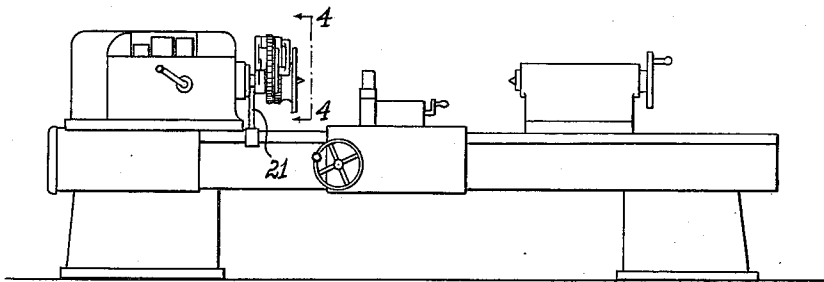


FIG. 4

FIG. 6

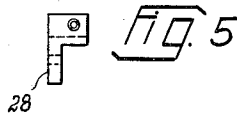
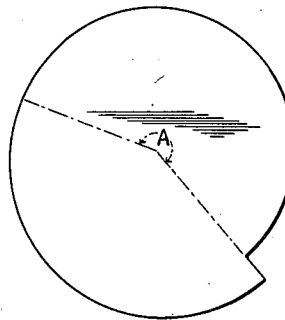
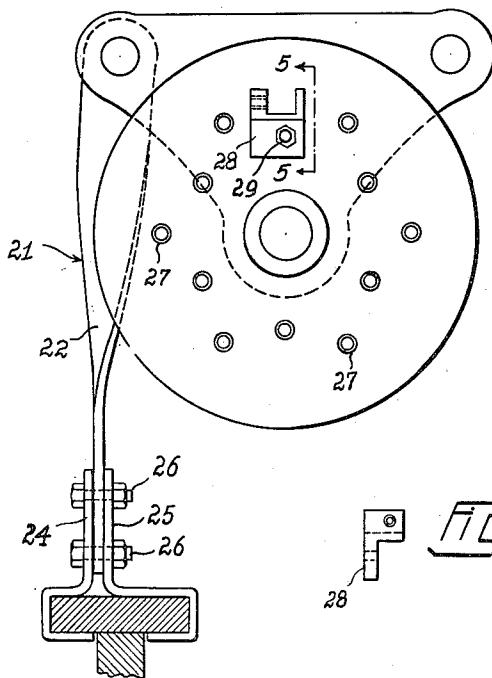


FIG. 5

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OSCILLATING ATTACHMENT FOR ROTARY MACHINES

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5 Claims. (Cl. 82—34)

1

This invention relates to improvements in oscillating attachments for rotary machinery.

The general object of the present invention is to provide an improved attachment for rotary machines such as lathes for holding the work and imparting an oscillating movement thereto during cutting.

A further object of the invention is to provide an attachment adaptable to turret lathes, drill presses and other rotary machines as well as lathes.

A further object of the invention is to provide an attachment in which the operating parts are self-contained and formed as a unit.

With these and still other objects which will appear in the following full description in mind, the invention consists in the combinations and arrangements of parts and details of construction which will now first be fully described in connection with the accompanying drawing and then be more fully pointed out in the appended claims.

In the drawing:

Figure 1 is a side view of an attachment embodying the invention in a preferred form;

Figures 2 is an end view or view looking in the direction of the arrows 2—2 of Figure 1;

Figure 3 is a general view in side elevation showing the attachment mounted on a bench lathe;

Figure 4 is a view on the line 4—4 of Figure 3 showing the face plate, frame structure and means for fastening the attachment against rotary movement;

Figure 5 is a detail view looking in the direction of the arrows 5—5 of Figure 4; and

Figure 6 is a view of one form of cam which may be cut by the device of the invention.

Referring now to Figures 1 and 2, the attachment includes a shank 1 adapted to be held within the chuck of a rotary machine of any of various types, and intermediate mechanism by means of which the rotation of the shank 1 imparts an oscillatory movement to the face plate 2 and center 3 of the attachment. The intermediate mechanism is mounted upon a generally triangular frame 4, the shank 1 having a collar 5 engaging against a face of the frame 4 and carrying a shaft 6 rotatably borne in the frame enlargement 7. This shaft rotates a pinion 8 affixed thereto. A wheel 9 in driven engagement with the pinion 8 is carried on the frame 4 by means of a stub shaft 10 and, in turn, carries a crank pin 11. The stroke of the crank pin 11 is adjustable, the pin being carried for this purpose by a plate 12

2

pivotally fastened to the gear 9 at 13 and adapted to be fixed in any position through a desired range of adjustment by means of a bolt 14 riding in an arcuate slot 15 formed in the gear 9. Crank rod 16 connects crank pin 11 through wrist pin 17 to a gear sector 18 rotatably carried on the frame 4 by stud shaft 19 and this gear sector, in turn, drives a wheel 20 fixed to the hub of the center 3 and carrying the face plate 2, these elements being rotatably carried upon the shaft 6. The frame 4 being held stationary, rotation of shank 1 will accordingly rotate pinion 8 and gear 9 thereby causing an oscillatory movement of the gear sector 18 and gear 20. The gear ratio between the pinion 8 and wheel 9 and between gear 20 and sector 18 will preferably be the same, and may conveniently be one to two, so that a fixed relation between the oscillatory movement of the face plate 2 and center 3 on the one hand and the machine drive, on the other, is maintained. The angle of oscillatory movement may conveniently be adjusted by means of the bolt 14 and slot 15 between zero degrees and approximately two hundred and forty degrees or thereabouts.

While, as stated above, the device may be utilized with any of a variety of rotary machines, its manner of attachment thereto is simple and accordingly its use with a bench lathe is shown by way of illustration in Figure 3. In that figure, the device is shown as mounted on the headstock of a conventional bench lathe, it being understood that the shank 1 is gripped in the chuck thereof and the only other attachment required is a member 21 serving to prevent rotation of the frame 4. As more clearly shown in Figure 4, the member 21 may comprise a twisted strap 22, the upper end of which is fastened to one corner of the frame 4 by means of a nut 23 (Figure 1) and the lower end of which is fastened by a suitable fitting to a track of the lathe. This fitting may take the form, as shown, of a pair of clamp members 24 and 25 secured to the strap 22 by bolts 26. Where desired, the strap 22 may be made adjustable for regulating angle of the work piece with relation to the tool holder. As shown in Figure 4, the face plate 2 is preferably provided with a number of threaded holes 27 so that a dog 28 may be secured in any of these holes by a screw 29, for adjusting the angular position of the work piece. The dog 28, itself, and the manner of engaging it with the work piece being otherwise conventional, they will not be further described.

While the device of the invention is capable of

operation to produce relatively complex shapes, its principles of operation will be understood sufficiently by reference to a simple cam as shown in Figure 6. As there shown, the concentric angle A subtends an angle of about two hundred and forty degrees. Such a part cannot be turned by continuous rotation, since the rise of the cam forms an obstruction to the tool. When utilizing the attachment of the invention for cutting such a shape, the proper angle of oscillation is selected by adjusting the crank pin plate 12, and the work is properly related to the cutting tool by fastening the dog 28 in the proper hole 27 of the face plate 2. The motion of the face plate being oscillatory the concentric portion of the cam will be cut without interference by the rise. In view of the foregoing description, the manner of utilizing the attachment for cutting cams and other parts of widely different shapes will be obvious and hence will not be further described. The manner of utilizing the device with a turret lathe will be obvious and in the case of a drill press or other vertical machine, the device is merely inserted in the machine chuck in a vertical, instead of horizontal, position. In all cases, the frame 4 is prevented from rotating by attaching it to any convenient non-rotary portion of the machine, by means of the member 21 or other convenient device.

What is claimed is:

1. An oscillating attachment for rotary machines comprising in combination, a frame, a shaft rotatably mounted in said frame and having a shank adapted to be held in a machine chuck, a pinion fixed to said shaft, a face plate and drive wheel therefor rotatably mounted on said shaft, an intermediate gear wheel rotatably carried by said frame in driven engagement with said pinion, a gear sector rotatably carried by said frame in driving engagement with said face plate drive wheel, and an adjustable crank connection between said intermediate gear wheel and said gear sector.

2. An oscillating attachment according to claim 1, in which the drive ratio between the said pinion and intermediate wheel is the same as that between the said face plate drive wheel and the said gear sector.

3. An oscillating attachment for rotary machines comprising in combination, a frame, a shaft rotatably mounted in the said frame and having a shank adapted to be held in a machine chuck, a pinion fixed to said shaft, a face plate and drive wheel therefor rotatably mounted on said shaft, an intermediate gear wheel rotatably carried by said frame in driven engagement with said pinion, a member rotatably carried by said frame in driving engagement with said face plate drive wheel, and adjustable means connecting said member to said intermediate gear wheel for oscillating the said member through an adjustable arc upon rotation of the said intermediate gear wheel.

4. An oscillating attachment for rotary machines comprising in combination, a frame, a shaft rotatably mounted in the said frame and having a shank adapted to be held in a machine chuck, a face plate rotatably mounted on said shaft, and a mechanical movement for converting rotary movement into oscillatory movement mounted entirely upon the said shaft and frame, whereby, when the said frame is held against rotation, rotation of the said shaft produces oscillation of the said face plate.

5. An oscillating attachment according to claim 4, in which the said mechanical movement comprises also means for adjusting the arc of oscillation of the said face plate corresponding to a rotation of the said shaft.

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