Oct. 7, 1941. B. E. SHERRILL 2,258,071

LATHE GRINDING ATTACHMENT

Filed Sept. 29, 1939 2 Sheets-Sheet 1

Fig. 1.

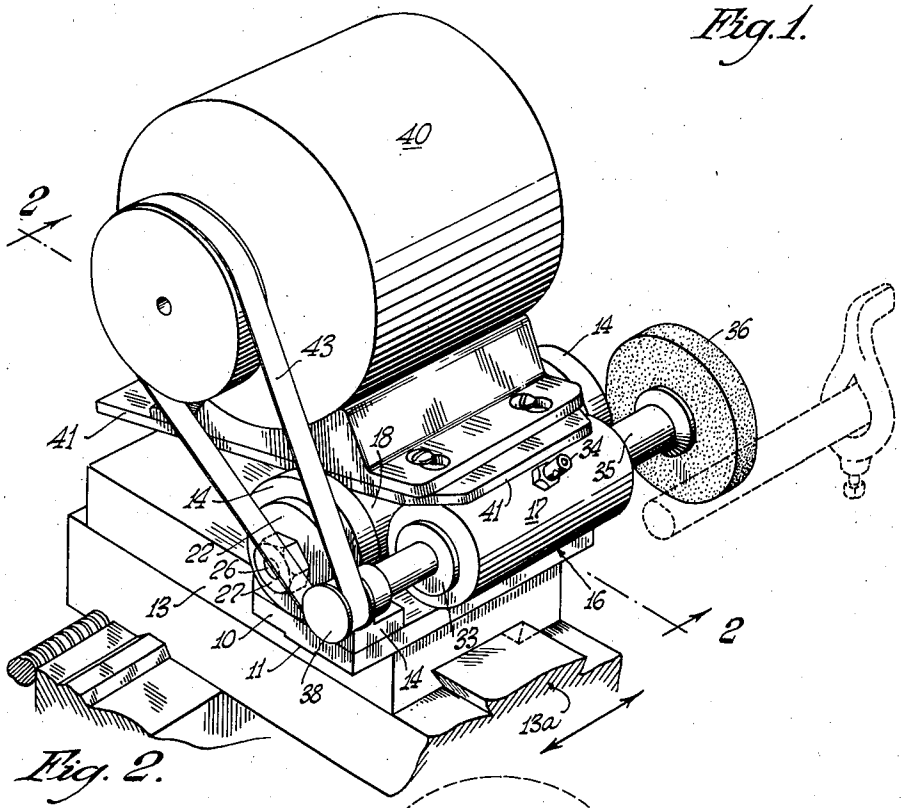
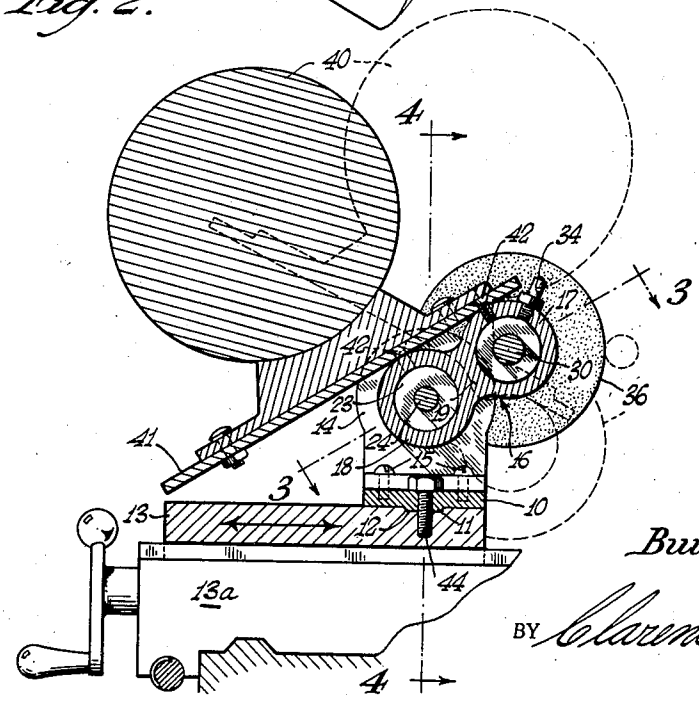


Fig. 2.



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Fig. 3.

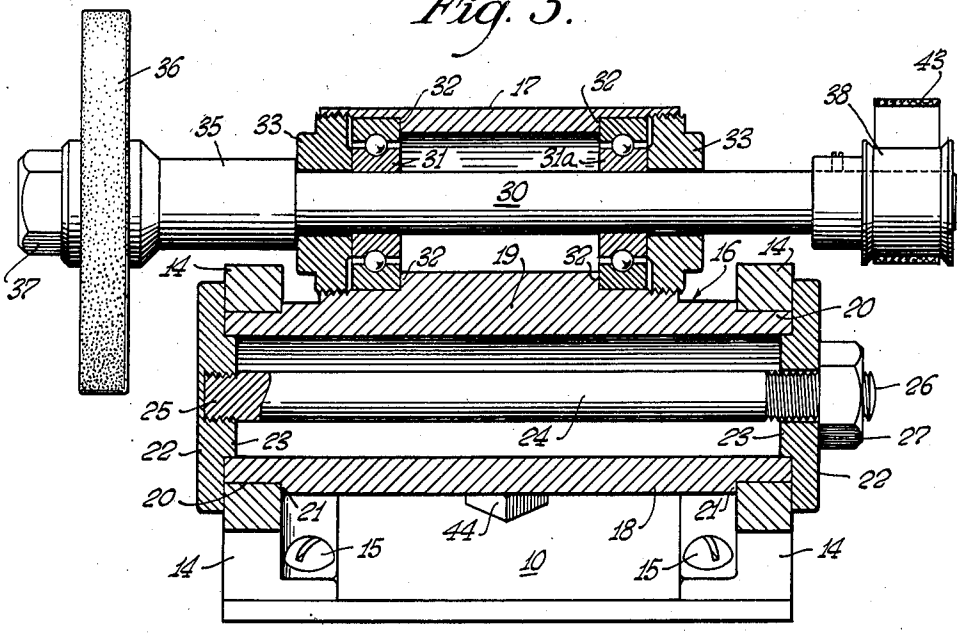
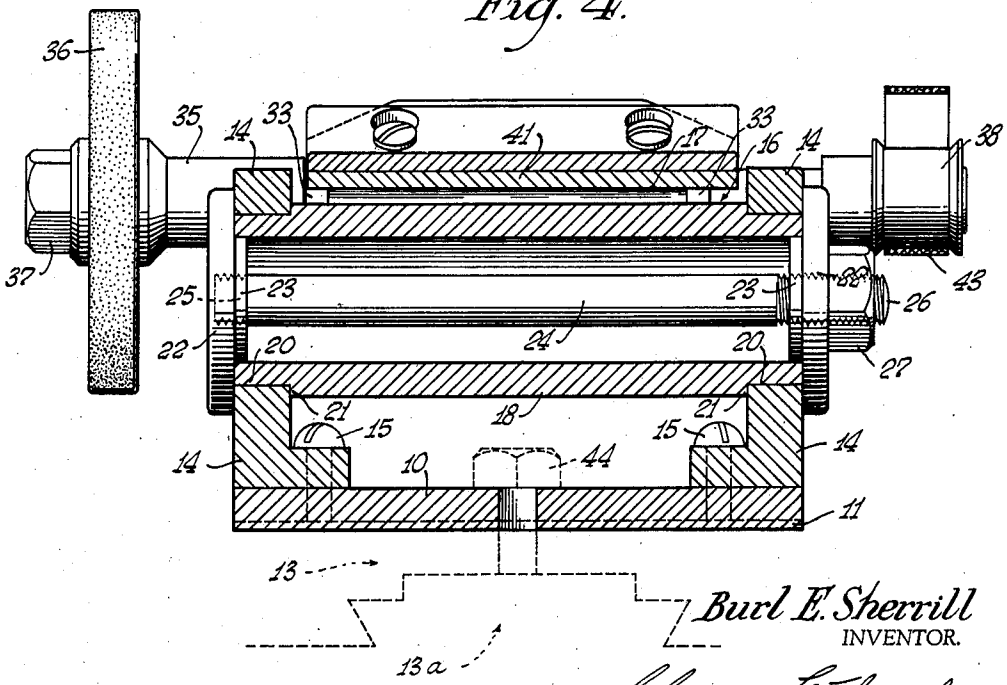


Fig. 4.



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LATHE GRINDING ATTACHMENT

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Application September 29, 1939, Serial No. 297,079

7 Claims. (Cl. 51—259)

This invention relates to improvements in lathe attachments and has as its principal object the provision of a power-driven adjustable grinder adapted for attachment to the tool carriage of a lathe for accurate adjustment regardless of the "swing" of the lathe.

A further and more particular object is the provision of an attachment of the class described including a base member adapted for attachment to the tool carriage of a lathe and having a swivel member mounted between posts or trunnions on the base member for movement about a horizontal axis usually extending transversely of the direction of adjusting movement of the tool carrier or carriage (and therefore in parallelism with the movement of the main carriage 13*a* of the lathe), the swivel member having an eccentric journal in which is carried a spindle for the grinder and which extends in parallelism with the pivotal axis of the swivel member, the attachment further including a motor mounted on the swivel member and drivingly connected with the spindle, together with means for clamping the swivel member in various positions of adjustment.

Viewed from another aspect, it is an object of the invention to provide an attachment of the class described including a swivel member, a grinding spindle, and a driving motor assembled as a unit with the axes of the motor shaft, swivel, and spindle arranged in parallelism to rock about the pivotal axis of the swivel as a common center.

A further and specific object is the provision of a swivel structure for use in an attachment of the class described and including parallel sleeve portions in one of which is journaled a grinder spindle and in the other of which is journaled a swivel attachment and means for securing the swivel member in positions of adjustment relative to its swivel axis, the swivel member further including a mounting plate and motor means secured thereon for rocking movement with the swivel member.

Other objects, advantages and novel aspects of the invention reside in certain details of construction as well as the cooperative relationship of the component parts of the illustrative embodiment described hereinafter in view of the annexed drawings, in which:

Fig. 1 is a perspective of the complete attachment;

Fig. 2 is a vertical section along line 2—2 of Fig. 1;

Fig. 3 is a section through both the swivel and spindle axes of the swivel member, taken along line 3—3 of Fig. 2; while

Fig. 4 is a vertical section through the swivel axis looking in the direction of line 4—4 of Fig. 2.

While the grinding attachment of the present invention is especially intended for use with lathes, it will be understood that it is susceptible of other uses and applications, and the references hereinafter to the use of the attachment in connection with certain parts of the lathe are not to be construed as a limitation upon the invention.

In the preferred embodiment illustrated in Fig. 1, the novel grinding attachment includes a mounting or base member in the form of a plate 10 having a keying tongue 11 on its underside for engagement in the usual keyway 12 provided in the tool carriage 13 of a lathe. The base plate is provided with oppositely positioned trunnions or posts 14 which, in the present instance, are secured to the base plate by means such as the screws 15.

Mounted between the posts 14 is a swivel member generally indicated at 16 and comprising (Fig. 2 particularly) a pair of tubular members or sleeves 17 and 18 joined by a webbing 19 which is preferably integral with the metal of the sleeves.

As shown in Fig. 3, the sleeve 18 is provided with reduced end portions 20 which fit into openings in the posts 14 with shoulder portions 21 accurately aligning the sleeve for swivel or rotative movement in the posts or trunnions. A pair of end bushings or plates 22 is fitted against the opposite ends of the main sleeve portion 18, each bushing having a reduced portion 23 which fits snugly into the bore of the sleeve portion.

Means for securing or locking the swivel structure in positions of adjustment relative to the mounting, includes a rod 24 threaded at one end 25 into one of the bushings 22 while the opposite threaded end portion 26 of the rod passes freely through the corresponding bushing for engagement with a retaining nut 27 which, when loose, permits pivotal movement of the sleeve portion 18 and hence of the entire swivel member, the nut being turned up to lock the swivel member in any of the positions of adjustment illustrated, for example, in Fig. 2.

The grinding mechanism includes the provision (Fig. 3) of a spindle 30 journaled in roller bearings 31 and 31*a* seated upon shoulders 32 in the bore of the sleeve portion 17 at opposite ends thereof, bushings 33 being threaded into the ends of the sleeve to secure the bearings in place,

displacement of the spindle being prevented preferably by a forced fit of bearing 31 on the spindle. Lubrication may be effected through a fitting 34 (Figs. 1 and 2), grease being forced and packed in the sleeve, and working into the bearings.

The grinder spindle is provided with a shoulder portion 35 against which is seated the grinding wheel or other tool member 36 retained by a nut 37. At the opposite end of the spindle is a pulley 38.

Power drive means includes an electric motor 40 (Figs. 1 and 2) carried on a mounting plate 41 secured by means such as the screws 42 threaded into each of the sleeve portions 17 and 18 of the swivel unit so as to extend in parallelism with a plane through both axes 24 and 30 in the sleeves. Means such as the belt 43 provides a driving connection between the motor and the pulley 38.

In the use of the device, the attachment is seated on the tool carriage 13 of the lathe in the customary manner and secured in position by means such as the bolt 44 (Fig. 2), whereupon the main carriage 13a is moved to transport the grinder attachment into approximate operative engagement with respect to the work stock, as illustrated in dotted lines in Fig. 1, whereupon the nut 27 is loosened and the entire grinder unit rocked about the rod 24 as a swivel axis in order to bring the grinding wheel 36 into more accurate engagement with the work stock, it being apparent that by manipulation of the tool carriage, the swivel member of the grinding attachment, or the stock itself, a variety of angles of contact and approach may be achieved, and the grinder unit may be held stationary with respect to the work stock once the proper setting is made, or the main carriage may be moved in the usual manner to transport the grinder attachment relative to the work stock.

Thus, it will be apparent that the novel attachment makes it possible to adjust the grinder for use in lathes of various sizes, that is to say (within the limits of the radial swing of the swivel member) lathes having different "swings" or radial clearances between the dead center or chuck and the rails or bed. In this connection, a feature of novelty in the attachment resides in the mounting of the swivel member to pivot about a horizontal axis extending in the general direction of movement of the lathe carriage, although it will be apparent that the advantages of the particular structure of the swivel unit and mounting may be adapted for use otherwise than in conjunction with a lathe.

The various advantages and objects of the invention may be accomplished by modifications of the particular embodiment specifically described herein, and it is intended that the appended claims shall include all equivalent arrangements fairly coming within their call.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A grinding tool comprising, in combination, a mounting plate with opposite trunnion posts, a swivel member including parallel bores, the opposite ends of one of said bores arranged in said trunnion posts to mount said member for rocking movement between said posts, a grinder spindle journaled in the other bore, a motor platform mounted on said member, a motor on said platform with a drive shaft parallel with said spindle, means drivingly connecting said drive shaft and spindle, and means arranged coaxially with the first mentioned bore and coacting with the ends of said bore to secure the swivel member in positions of rocking adjustment.

2. A lathe grinder attachment comprising, in combination, a base member with opposite posts thereon, a swivel member journaled between said posts, a grinder spindle journaled in said swivel member for rotation about an axis parallel with the journal axis of the swivel member, a motor mounting plate attached to said swivel member so as to lie in a plane approximately parallel with a plane through said journal and spindle axes, a motor mounted on said plate with its driving axis extending in parallelism with the aforesaid axes and situated at one side of said journal axis away from the spindle, means providing a driving connection between said motor shaft and said spindle, and means coacting with the journaling of said swivel member for securing the latter in positions of adjustment.

3. A lathe grinder attachment comprising, in combination, a base member, oppositely positioned posts on said member, a swivel member provided with parallel bores therethrough, the marginal portions at opposite ends of one of said bores each being journaled respectively in one of said posts, bushing means engaged in said opposite ends of said bore, and means interconnecting said bushing means for clampingly bearing the same against said posts to hold said swivel member in positions of rocking adjustment, bearing means engaged in said other bore, and a grinder spindle supported for rotation in said bearing means about an axis parallel with the rocking axis of said swivel member, a motor platform in the form of a plate attached to said swivel member so as to lie in a plane approximately parallel with a plane through said rocking axis and spindle, a motor mounted on said platform with a drive shaft extending in parallelism with said spindle, means providing a driving connection between said drive shaft and spindle, and a grinding element rotated by said spindle.

4. In a grinding attachment, the combination with a base member of swivel mechanism comprising opposite posts on said base member and a pair of tubular elements arranged in parallel side by side relationship, one of said elements being rotatably mounted at its opposite ends on said posts, means for clamping said member against rotation in positions of adjustment, a spindle journaled in the remaining tubular element, said spindle being adapted to have grinding and analogous tool elements mounted thereon, a platform seated against said tubular elements, and a motor on said platform and drivingly connected with said spindle.

5. In a grinding attachment of the class described, a swivel structure including a base, opposite trunnion posts on said base, said posts having aligned bores, a first cylindrical tube having reduced portions formed at the opposite axial ends thereof and each seating in a bore in one of said posts, a second cylindrical tube secured in parallelism flush against said first tube, a spindle journaled in said second tube, said second tube providing a grease chamber for said spindle, a motor platform secured to said tubes, a motor mounted on said platform, means drivingly connecting the motor and spindle, and means for holding said first-mentioned tube against rotation relative to said posts.

6. In a grinder attachment, a swivel mechanism comprising means providing opposite trun-

nion posts, a first cylindrical member extending between said posts and journaled at its opposite ends therein for rotational adjustment, means for securing said member in positions of adjustment and including clamping bushings at the opposite ends of said cylindrical member, and means extending coaxially of said cylindrical member and engaged in said bushings for releasably drawing the latter against the ends of the cylindrical member and posts in clamping action, a second cylindrical member fixed in parallelism with said first-mentioned cylindrical member, spindle means journaled in said first-mentioned cylindrical member, the latter providing an internal bore around said spindle constituting a grease chamber, and a driving motor and means mounting the same for movement with said cylindrical members, said driving motor being drivingly connected with said spindle.

7. A device of the class described comprising, in combination, a swivel member having parallel bores therethrough, a mounting base, a pair of trunnion posts on said base, means including formations arranged at the opposite axial ends of one of said bores and disposed coaxially of the latter for rotatably seating said swivel member against rotative displacement relative to said posts, a spindle journaled in the second bore, the latter constituting a lubricant chamber, and means communicating into said last-mentioned bore for the introduction of lubricant therein, a driving motor and means mounting the same on said swivel member for movement therewith, said motor being drivingly connected with said spindle, said spindle being adapted to drive rotary tools.

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