C. HARDY.

GRINDING ATTACHMENT FOR LATHES.

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1,368,499. **Patented Feb. 15, 1921.**

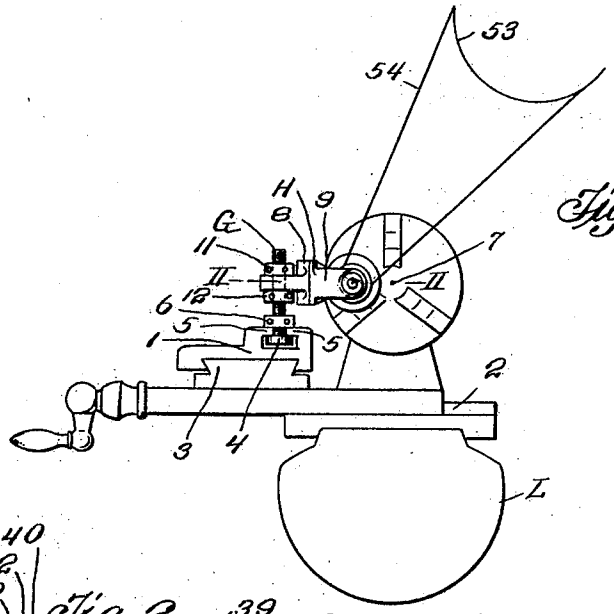


Fig. 1.

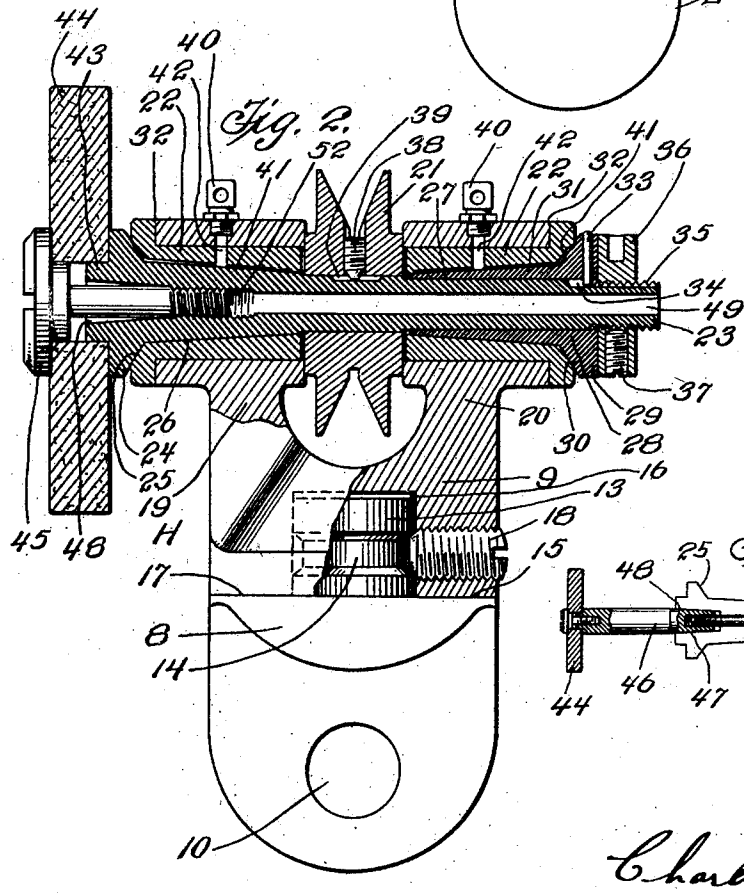


Fig. 2.

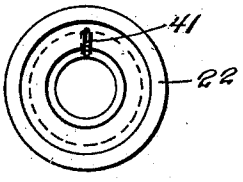


Fig. 3.

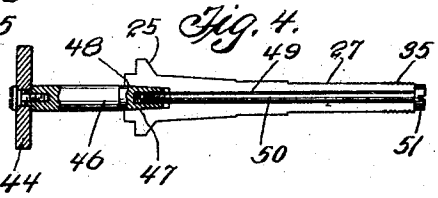


Fig. 4.

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GRINDING ATTACHMENT FOR LATHES.

1,368,499. Specification of Letters Patent. Patented Feb. 15, 1921.

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To all whom it may concern:

Be it known that I, CHARLES HARDY, residing at Coney Island, in the county of Kings and State of New York, have invented certain new and useful Improvements in Grinding Attachments for Lathes, of which the following is a specification.

This invention relates to a grinding attachment for lathes.

The object of the invention is to provide a simple, inexpensive and yet highly efficient device of this character.

A further and more detailed object is to provide a grinding attachment and means whereby it may be adjustably connected with the lathes so as to be capable of adjustment to dispose the grinding element in various planes with respect to the rotating axis of the lathe.

A further object is to provide means whereby the grinding element of the attachment may be connected therewith in different ways so as to accommodate it for the different types of work which it is desirable that it shall perform.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles, constituting the invention; and the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which I have shown merely a preferred form of embodiment of the invention:

Figure 1 is a side elevational view of the attachment showing the same in operative position upon a lathe.

Fig. 2 is an enlarged view of the attachment detached and shown in horizontal section substantially upon the plane of line II of Fig. 1.

Fig. 3 is an end view of one of the bearing sleeves employed, and

Fig. 4 is a diagrammatic detail view, on a reduced scale showing a different manner of attaching the grinding element.

Referring to the drawings for describing in detail the structure which is illustrated therein, the reference character L indicates the lathe supporting the part 1 which ordinarily is employed to carry the tool post, the part 1 being movable transversally of the lathe bed through the medium of the guide 2 and being movable longitudinally of the lathe bed through the medium of the guide 3 in the usual manner so that the tool post member 1 may be adjusted in any horizontal direction.

The reference character G indicates a threaded standard which is supported by the part 1 in the location ordinarily occupied by the tool post, the tool post being temporarily removed, and the reference character H indicates the grinding attachment proper which is supported by the standard G to project laterally therefrom in a horizontal plane.

The standard G is provided with a head 4 at its lower end which engages beneath the shoulders 5 of the part 1 and a clamp nut 6 is threaded upon the standard to engage the top surface of the shoulders 5 to grip said shoulders between the nut and the head so as to retain the standard in a rigid vertical position. The length of the standard is preferably such as to extend for some distance above the horizontal plane of the rotating axis as 7 of the lathe.

The attachment proper consists of a body member 8 and a spindle carrying member 9.

The body member 8 is apertured as at 10, to telescope over the standard G and is adapted to be held in any position of vertical adjustment along the standard by means of a pair of clamp nuts 11 and 12 which are threaded upon the standard, one below and one above the body member. At its outer end it carries a stud 13 which is formed with an annular groove 14 therein. A flat annular surface 15 is provided surrounding the stud.

The spindle carrying member 9 is provided at its inner end with a socket 16 adapted to receive the stud 13 and with a flat annular surface 17 adapted to rest flat against the surface 15 of the body member when assembled.

These parts afford a convenient radial adjustment of the member 9 with respect to the body member, and a set screw 18, which is carried by the member 9 engages within the groove 14 to hold the member 9 in any position of radial adjustment and also to retain the member 9 against disconnection from the stud.

At its outer end the spindle carrying member is bifurcated to form a pair of legs 19

and 20 with an open space between them adapted to receive a drive pulley 21. The ends of the legs 19 and 20 are enlarged and each is apertured to receive a bearing sleeve 22. The sleeves 22 are rigidly fixed in position preferably by being driven into the apertures. They are immovable in the ordinary use of the device but may be driven out at any desired time for effecting repairs, etc.

A spindle 23 extends through the bearing members 22, and the pulley 21 is carried by a central portion thereof which bridges the space between the legs 19 and 20. The outer, or left hand, end of the spindle is enlarged to provide a head 24 and the inner surface as 26, of this head is cone-shaped and is received in a correspondingly shaped depression formed in the outer end of the adjacent bearing 22. From the inner end of the cone-shaped portion 24 to the inner end of the adjacent sleeve 22 the spindle is slightly tapered as indicated at 26, and the bearing opening in the sleeve is likewise tapered to provide a snug fit.

The inner end portion of the spindle is continued at a reduced diameter as at 27, so as to facilitate assembling, as will be readily understood, and the bearing connection with the inner sleeve 22 is provided by means of a bearing sleeve 28 which is fitted to the part 27 of the spindle and which is formed with a head 29 providing a cone surface 30 and with a tapered portion 31 providing an outwardly tapering exterior surface similar to that described at the outer end of the spindle.

The two bearing sleeves 22 are of identical shape and the cone-shaped seats and tapering openings thereof are in opposed relation. Each is provided with a shoulder 32 at its outer end for engaging against the outer surface of the legs 19 and 20 to limit possible inward movement at all times. The bearing member 28 is connected with the spindle in such a manner as to have a slight longitudinal movement upon the spindle but no rotary movement. This is effected by means of a pin 33 which is carried by the bearing member and which extends into a runway 34 formed longitudinally of the spindle. The adjacent end portion of the spindle is threaded as at 35 and carries a clamp nut 36 by means of which the bearing member may be slid to cause it to move in one direction while drawing the spindle in the opposite direction, thus causing the cone and tapered parts of the spindle and bearing member 28 to assume a proper rotating relation within the bearing members 22. A set screw 37 may be carried by the clamp nut 36 to retain it against possible accidental movement.

The pulley 21 is connected to the spindle by means of a set screw 38 which extends into a longitudinal slot 39 formed in the spindle, whereby to provide the necessary movement of the spindle for the adjustment above described while at the same time retaining the pulley rotatable with the spindle.

Oil cups as 40, may be arranged for lubricating the interiors of the bearing sleeves 22. For this purpose each bearing sleeve is formed with a small longitudinal groove 41 at its inner surface terminating short of the two ends of said surface as clearly indicated, and with a passage 42 extending from the groove 41 through the sleeve to the oil cup, the oil cup being carried by the respective leg of the member 9 and the aperture 42 being continued through the material of the leg to the oil cup.

At the outer end of the spindle the head 24 is provided with a reduced extension 43 adapted to receive the grinding wheel 44. The retaining screw 45 is threaded into the end of the spindle to retain the grinder firmly in position.

In some instances it is desirable that the grinder be supported at a greater or less distance from the head 24 and for this reason it is contemplated that an extension piece, as shown at 46 in Fig. 4 may be employed carrying the grinder at its outer end. The extension piece 46 may be connected to rotate with the spindle by any desired means but preferably it is formed with a tapered inner end portion 47 adapted to be received within a tapered seat 48 formed at the outer end of the spindle. The seat 48 is formed as a conical enlargement of a central bore 49 which extends throughout the length of the spindle, and a tiebolt 50 extends through this bore into threaded engagement with the inner end of the extension 46, the bolt having a head 51 for engaging the inner end surface of the spindle whereby rotation of the bolt will draw the tapered portion 47 of the extension inwardly into firm engagement with the spindle.

The threads, as 52, for receiving the inner end of the screw 45 are formed within the bore 49 at the inner end of the seat 48, and it will be noted that the seat 48, by its conical shape, provides a desirable means for facilitating entry of the end of the screw into engagement with said threads 52.

It should also be noted that although the member 44 is illustrated, and has been herein referred to as a grinding wheel, nevertheless it is obvious that a milling wheel or other like device might readily be connected with the spindle to perform any desired operation upon the work in the lathe. By providing means whereby a grinding or milling device may be supported in operative relation at any angular position of adjustment relatively to the work in the

lathe, it is apparent that a vast number of different operations may be performed upon the work in a simple, efficient and expeditious manner. Various parts of the work may be milled, ground or polished while the work is rotating in the lathe. The helix angle of threads may be readily ground, or operations may be performed either interiorly or exteriorly of the work.

Any suitable means, as the drive wheel 53, and belt 54, may be employed for driving the spindle through the medium of the pulley 21.

It is to be particularly noted that the axis of rotation of the member 9 about the stud 13 extends so that it directly intersects the axis of rotation of the spindle. Also that the point of intersection with the axis of the spindle is directly in the center of the pulley 21. It will thus be seen that rotation of the member 9 about the stud 13 will produce no appreciable movement of the member 44 longitudinally of the rotating axis of the lathe. Also, and what is perhaps more important, that rotation of the member 9 about the stud will produce no bodily shifting of the position of the pulley 21. The position of the center of the pulley will remain unchanged so that the drive belt 54 will be able to continue its driving function without likelihood of causing trouble such as might arise if the center of the pulley be made to shift.

As many changes could be made in the construction without departing from the scope of the invention as defined in the following claims, it is intended that all matter contained in the above description or shown in the accompanying drawings, shall be interpreted as illustrative only and not in a limiting sense.

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

1. A grinding attachment for lathes comprising, a grinder carrying member, a support therefor comprising a substantially vertical standard from which said member projects in a substantially horizontal position, and said member including a part within which the grinder is rotatably mounted and means whereby said part is rotatably connected for adjustment about a horizontal axis, the axial line of which intersects the rotating axis of said grinder.

2. A grinding attachment for lathes comprising, a grinder carrying member, a spindle upon which the grinder may be directly mounted, said spindle being rotatably carried by said member, an extension member through the medium of which the grinder may be indirectly connected with the spindle, and said spindle having parts adapted to receive and removably retain said extension member.

3. A grinding attachment for lathes comprising, a grinder carrying member, a spindle adapted for directly carrying the grinder, said spindle being rotatably mounted in said member, and the spindle having a longitudinal bore therethrough terminating in a conical seat at one end thereof, the conical seat being adapted to receive an extension member and the remainder of the bore being adapted to receive a tightening bolt therethrough for engaging the extension member to retain the extension member within the seat, whereby the grinder may be supported by the extension in rigid relation to the spindle.

4. A grinding attachment for lathes comprising a grinder carrying member, supporting means adapted to be connected with the bed of the lathe for movement therealong, a standard carried by said supporting means projecting upwardly therefrom, the grinder carrying member being connected with said standard, being rotatable thereabout in a substantially horizontal plane and being vertically adjustable along the length of the standard, and means for retaining said grinder carrying member in any position of vertical and rotary adjustment upon said standard.

5. A grinding attachment for lathes comprising a grinder carrying member, a support therefor, comprising a standard which projects upwardly from said support, the grinder carrying member being connected with said standard, being rotatable thereabout in a substantially horizontal plane and being vertically adjustable along the length of the standard, means for retaining said grinder carrying member in any position of vertical and rotary adjustment upon said standard, and said grinder carrying member including a separate part with which the grinder is connected and means whereby said separate part is rotatably adjustable about a horizontal axis.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES HARDY.

Witnesses:
L. GESSFORD HANDY,
AARON BENJAMIN.