

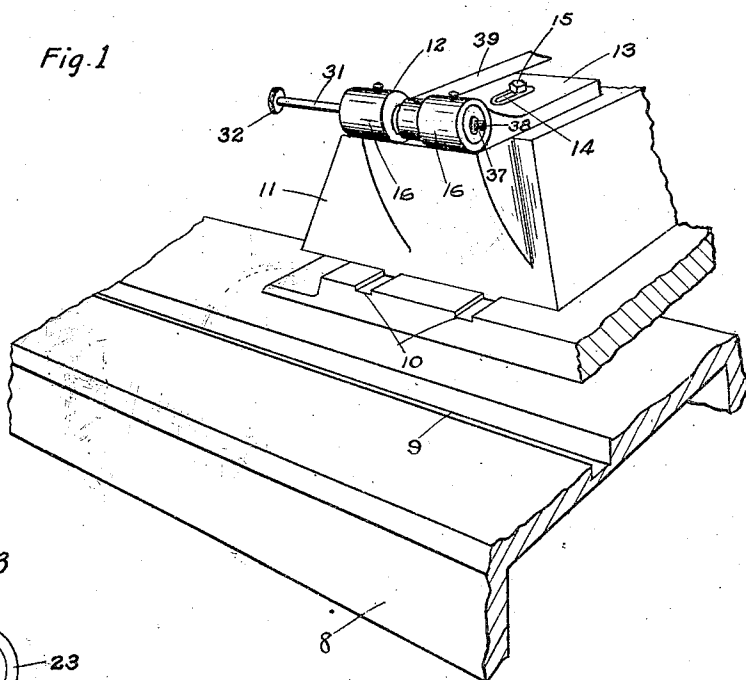
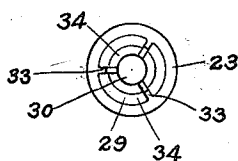
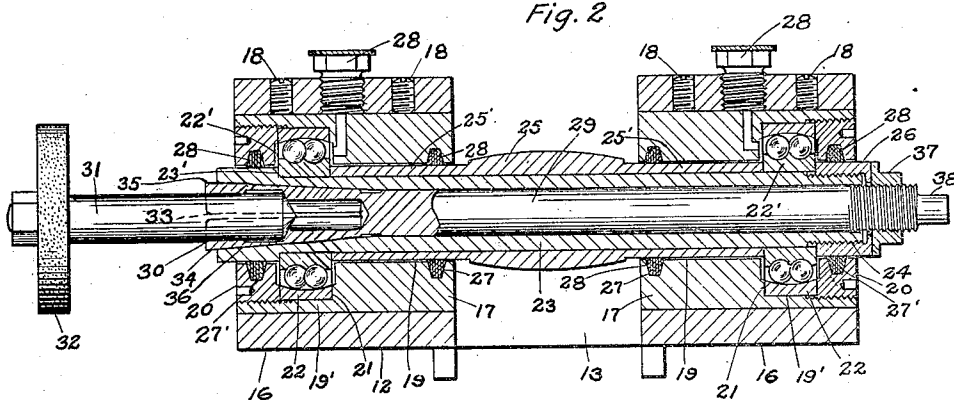
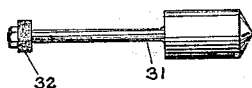
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1,496,107

H. C. WEBER

INTERNAL GRINDING FIXTURE

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UNITED STATES PATENT OFFICE.

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INTERNAL GRINDING FIXTURE.

Application filed March 3, 1921. Serial No. 449,339.

To all whom it may concern:

Be it known that I, HENRY C. WEBER, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Internal Grinding Fixtures, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in internal grinding fixtures.

Internal grinding fixtures now in general use are attachable to universal machines of the lathe type and are provided with removable grinding spindles, and these spindles are secured to the driving shaft by adjustable means adjacent the spindle end of the fixture, with the result that in use the spindles are often knocked out of true running position in adjusting spindles in position.

It is one of the objects of the present invention to overcome the above mentioned objectionable feature, and provide an internal grinding fixture which may be easily mounted upon a universal machine and in which the grinding spindles are secured to the driving shaft by means controlled at the opposite end of the fixture to that to which the grinding spindle is connected.

A further object of the invention is to provide an internal grinding fixture in which grinding spindles of various diameters may be easily clamped to the driving shaft to grind work of various diameters.

A further object of the invention is to provide an internal grinding fixture in which the driving shaft is journaled in ball bearings and the bearings are protected in a manner to prevent the entrance of dust thereto.

A further object of the invention is to provide an internal grinding fixture in which the parts may be easily disassembled when desired.

A further object of the invention is to provide an internal grinding fixture which is of simple construction, is strong and durable, and is well adapted for the purpose described.

With the above and other objects in view, the invention consists of the improved internal grinding fixture and its parts and com-

binations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a perspective view of the improved internal grinding fixture shown mounted upon a portion of a universal machine of the lathe type;

Fig. 2 is a central longitudinal sectional view, on a larger scale, of the internal grinding fixture;

Fig. 3 is an end detail view of the end portion of the chuck; and

Fig. 4 is a side view of a smaller size grinding wheel and spindle.

Referring to the drawing, the numeral 8 indicates a portion of a universal machine of the lathe type which is provided with longitudinal and transverse guide ways 9 and 10 and a transversely movable carriage 11 which is adjustably connected to the guide ways 10. The improved grinding fixture 12 is provided with a laterally extending arm 13 having an elongated slot 14. A bolt 15 extending through the slot and threaded into the carriage adjustably holds the grinding fixture in position to grind work held by the rotating head of the lathe (not shown). Two spaced tubular bearing supporting members 16, formed integral with the arm 13, have bearing blocks 17 positioned therein which are removably maintained in position by set screws 18. Said blocks are formed with inner bores 19 and outer bores 19' of larger diameter, and said outer bores 19' are threaded to receive holding nuts 20 threaded therein.

Interposed between the shoulders 21 formed by bores of less diameter and the holding nuts 20, are positioned the outer fixed portions 22 of ball bearings, and said outer portions are firmly clamped therebetween. A tubular sleeve 23, extending through the bearing blocks 17 and the holding nuts 20, and free from contact therewith, is formed with an annular shoulder 23' on its inner end and a threaded portion 24 on its outer end. A pulley sleeve 25 snugly fitting the tubular sleeve 23 is formed with extensions 25' which pass freely through the bores 19 of the bearing blocks 17 but do not contact therewith. The inner or revoluble parts 22' of the ball bearings

are firmly mounted on the tubular sleeve 23, and at the inner end of said sleeve one of the bearing parts 22' is interposed between the shoulder 23' and the adjacent inner end of the extension 25'. The other or outer revoluble part 22' is interposed between the outer end of the other extension 25' and a nut 26 threaded on the outer end of the tubular sleeve 23. Said nut 26 firmly clamps the inner bearing parts 22' on the tubular sleeve 23 and in alinement with the outer bearing parts 22, and also firmly clamps the pulley sleeve 25 to the tubular sleeve 23.

To prevent the entrance of dust or other foreign matter into the ball bearings, the blocks 17 and the holding nuts 20 are provided with annular recesses 27 and 27' in their bores for holding felt rings 28 which bear against the tubular sleeve 23 and the pulley extensions 25' on opposite sides of each ball bearing.

Oil cups 28 provide for oiling the bearings.

Extending through the tubular sleeve 23 is a chuck bolt 29 having a spindle recess 30 formed in its inner end for receiving the spindles 31 of grinding wheels 32. Said recessed end is formed with a plurality of transverse cuts 33 to form chuck or clamping jaws 34 to firmly grip spindles 31 inserted into the recess 30. The outer portion of the recessed end of the chuck bolt is tapered, as indicated by the numeral 35, and the portion 36 of the bore of the adjacent end of the tubular sleeve 23 is correspondingly tapered, so that when the recessed end portion of the chuck bolt is drawn inwardly into the end of the tubular sleeve, the chuck jaws will be moved clampingly together.

The opposite end of the chuck bolt 29 is threaded to receive a clamping nut 37 for drawing the said bolt into clamping position. The outer end of the chuck bolt is formed with a flat-sided extension 38 for convenience in holding the chuck bolt while the nut 37 is being tightened and for tapping the bolt endwise when it is desired to release the grinding spindles.

The form shown in Fig. 4 illustrates the shape of the spindle for small grinding wheels.

In use the fixture is mounted on the cross feed carriage of a universal machine, and the pulley member 25 is connected to a

source of motion by a belt 39 in the usual manner. The clamping nut 37 is now loosened and the grinding wheel spindle is inserted in the chuck recess, and the clamping nut is tightened to draw the chuck bolt to clamping position and to clamp the bolt to the tubular sleeve. As the chuck is opened and closed from the opposite end to which the spindle is connected, there is no liability of the spindle being knocked or sprung out of true axial alinement with the axis of rotation of the tubular sleeve, and a better class of work will result.

From the foregoing description it will be seen that the invention is well adapted for the purpose described.

What I claim as my invention is:

1. A grinding machine, comprising a support, a pulley sleeve extending into said support, a tubular member extending through the pulley sleeve and having a tapered recess and a shoulder at one end, a clamping member extending through the tubular member and having a recessed and tapered clamping jaw end portion which engages the tapered recess of the tubular member, and a nut threaded on the end of the clamping member opposite to the jaw end and exerting a strain against the end of the pulley sleeve for moving the clamping member longitudinally and clamping the said member to the tubular sleeve and the tubular sleeve to the pulley sleeve.

2. A grinding fixture, comprising a support, a pulley sleeve extending into said support, a tubular member extending through the sleeve and having a tapered end recess and a shoulder at one end, a clamping member extending through the tubular member and having a recessed and tapered clamping jaw end portion which engages the tapered recess of the tubular member, a nut threaded on the tubular member opposite to the shouldered end for clamping the tubular member to the tubular sleeve, and a nut threaded on the end of the clamping member opposite to the jaw end and engaging the tubular member nut for moving said clamping member longitudinally and clamping the said clamping member to the tubular sleeve and further clamping the tubular member to the pulley sleeve and locking the tubular member nut in adjusted position.

In testimony whereof I affix my signature:

HENRY C. WEBER: