Feb. 21, 1956 J. R. FRIES ET AL 2,735,240

GRINDING WHEEL MOUNTING

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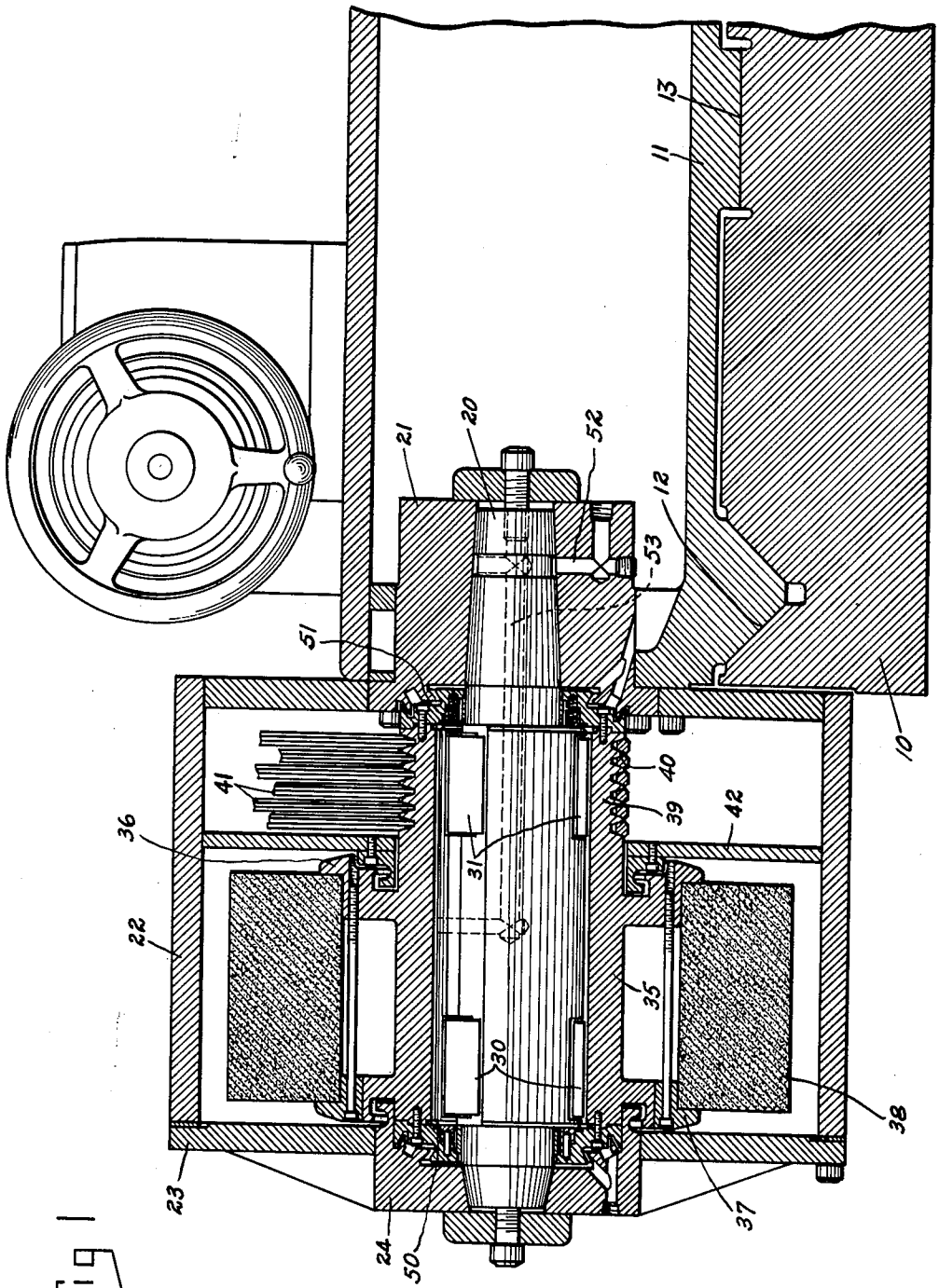


Fig. 1

INVENTOR
JOHN R. FRIES
HAROLD E. BALSIGER
BY Hughes & Roche
ATTORNEY

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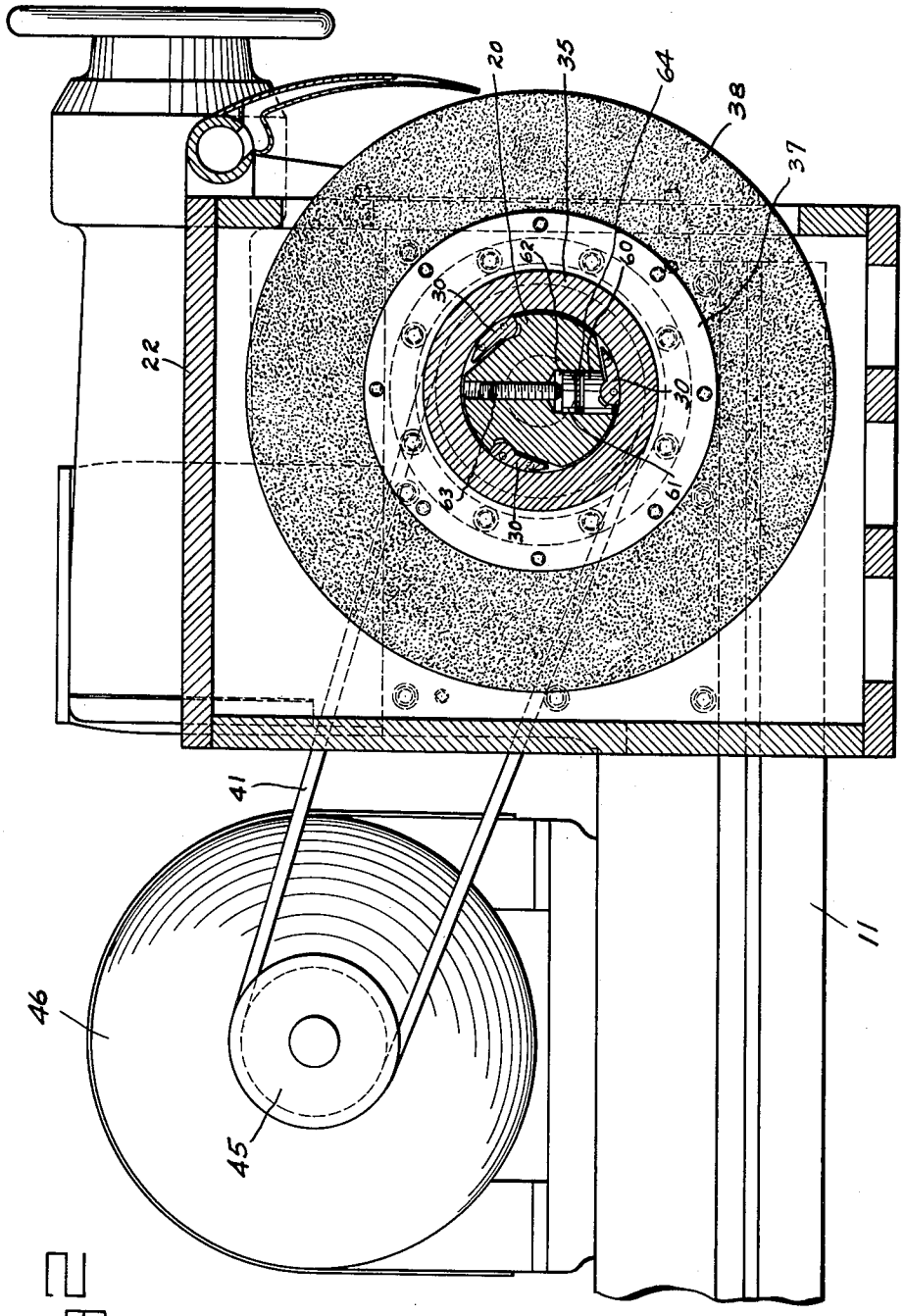


Fig 2

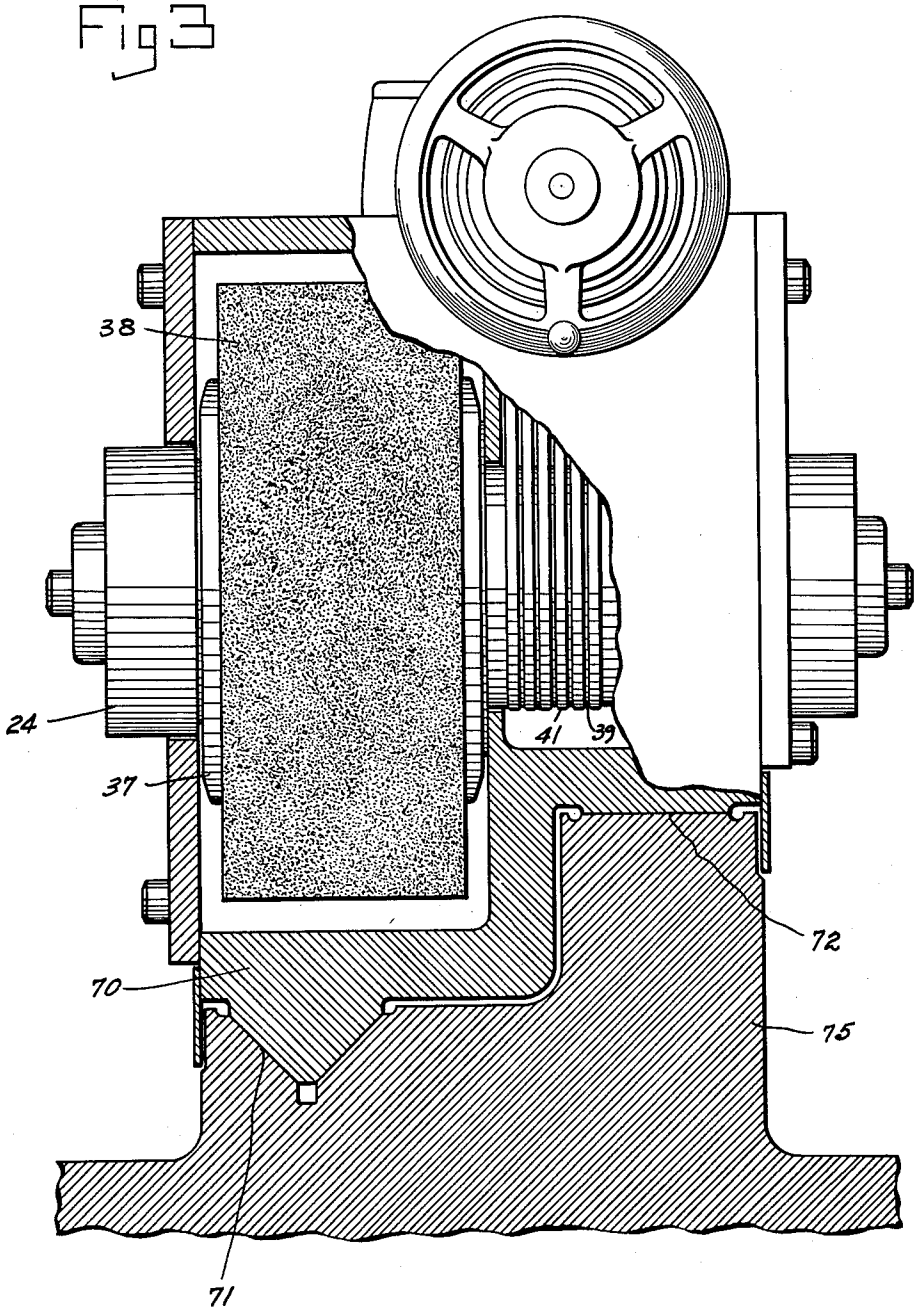
INVENTOR
JOHN R. FRIES
HAROLD E. BALSIGER
BY Hugh M Rocks.
ATTORNEY

Feb. 21, 1956 J. R. FRIES ET AL 2,735,240

GRINDING WHEEL MOUNTING

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Fig 3



INVENTOR
JOHN R. FRIES
HAROLD E. BALSIGER
BY Hughes & Rucker
ATTORNEY

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GRINDING WHEEL MOUNTING

John Robert Fries and Harold E. Balsiger, Waynesboro, Pa., assignors to Landis Tool Company, Waynesboro, Pa.

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4 Claims. (Cl. 51—166)

This invention relates to means for rotatably supporting a grinding wheel in a grinding machine.

The conventional grinding wheel mounting usually consists of a grinding wheel spindle rotatably mounted in spaced bearings in a wheelbase. The grinding wheel is mounted on a tapered portion at one end of the spindle and a driving pulley on a tapered portion at the other end of the spindle. The principal defect of this type of mounting is the fact that the grinding wheel and the driving pulley are at opposite ends of the spindle. The conflicting forces acting on the spindle as a result of this arrangement result in inaccuracy in the grinding operation. It is, therefore, an object of this invention to provide a grinding wheel mounting in which the driving means will be mounted adjacent the grinding wheel instead of being spaced therefrom.

A further object is to provide a non-rotatable spindle mounting.

A further object is to provide a grinding wheel center rotatably mounted on a stationary spindle.

A further object is to provide a bearing which automatically adjusts itself.

A further object is to provide a sealed, circulating lubrication system through the stationary spindle.

A further object is to provide an automatic end thrust bearing.

A further object is to provide a grinding wheel center having a pulley portion for transmitting rotation from a driving motor to the grinding wheel.

In the drawings, Figure 1 is a sectional front elevation showing the invention adapted to a conventional grinding machine.

Figure 2 is an end elevation, partly in section, showing the driving motor and the structure of the bearings supporting the grinding wheel.

Figure 3 is a front elevation, partly in section, showing a method of mounting a grinding wheel where the machine is designed to accommodate this type of mounting.

Numeral **10** indicates the bed of a grinding machine; **11**, a wheelbase slidably mounted thereon having a V guide **12** and a flat guide **13** laterally spaced therefrom. A stationary spindle **20** is supported at one end in a portion **21** of the wheelbase **11**. Said spindle extends outwardly through a wheel fender **22** attached to wheelbase **11**. The end plate **23** for said wheel fender has an enlarged center portion **24** in which the other end of spindle **20** is mounted. Between the points of mounting of said spindle are two axially spaced sets of shoe-type bearing members **30** and **31**.

Said bearing members are circumferentially spaced about said spindle and pivotally mounted thereon. A wheel center **35** has a more or less conventional flanged portion **36** and a flanged mounting ring **37** for securing a grinding wheel **38** thereon. A portion **39** of said center extending beyond said flanged portion has a plurality of V grooves **40** for receiving driving belts **41**. Said belts run to a pulley **45** on wheel drive motor **46**. A partition

42 in fender **22** provides separate compartments for the grinding wheel and the pulley portion **39**. Suitable lubricant seals **50** and **51** are provided between said wheel center **35** and spindle **20**. The chamber formed by said seals and wheel center is supplied with lubricant through the spindle **20** by means of passage **52** and passage **53** in portion **21**.

Members **30** and **31** are circumferentially spaced about said spindle at intervals of 120°. Each of the members **30** is pivotally mounted in spindle **20**. The radius of the bearing surface of each member is slightly less than the bore of the wheel center **35**. This difference in radius permits the formation of a film of lubricant between member **30** and the internal surface of wheel center **35**. An increase in grinding load on any of the members **30** would be applied at that portion of the member **30** nearest the pivot point and would tend to rotate member **30** in a clockwise direction, thus urging the longer end of the member against the internal surface of wheel center **35** and offering an increase in bearing pressure to counteract the above mentioned increase in load.

The means for adjusting clearance between bearing shoes **30** and the internal surface of wheel center **35** consists of pistonlike members **60** and **61** slidably mounted in a radial bore **62** in spindle **20**. Adjustment of said members in said bore is effected by means of adjusting screw **63**, also radially mounted in spindle **20** and adapted to engage the inner end of member **61**. One or more Belleville springs **64** inserted between members **60** and **61** serve to provide pressure of all bearing shoes **30** against the internal surface of wheel center **35**. A similar device is used in connection with members **31**. Since the members are spaced peripherally at 120°, adjustment of one is applied with equal force on the other two and thus only the one adjusting means is necessary for each set of shoes.

In Figure 3 there is shown a different method of mounting the grinding wheel on the bed. In this arrangement, the wheel support **70** has a V guide **71** directly beneath the grinding wheel, and a flat guide **72** directly beneath the pulley portion. Corresponding bearing surfaces are provided in the bed **75**. This arrangement is preferred where the machine is to be designed to receive this particular type of wheel mounting.

We claim:

1. In a grinding machine, a base, a support for a grinding wheel on said base, a stationary spindle mounted on said support, peripherally spaced bearing members on said spindle, a single adjusting means in said spindle acting radially on one of said bearing members, the peripheral spacing of said bearing members being such that said adjustment effects all of said bearing members equally, and a grinding wheel mounted for rotation on said bearing members.

2. In a grinding machine, a base, a support for a grinding wheel on said base, a stationary spindle having one end mounted in said support, peripherally and axially spaced shoe type bearing members on said spindle, a sleeve rotatably mounted on said bearing members, a grinding wheel mounted on said sleeve, means to rotate said sleeve and grinding wheel, means to automatically adjust one of said bearing members comprising a spring pressed plunger, said plunger serving also to adjust said other bearing members as a reaction to the force which it exerts on said one bearing member.

3. In a grinding machine, a bed, spaced guide surfaces on said bed, a grinding wheel support slidably mounted thereon, a spindle having one end mounted in said support, shoe type bearing members peripherally spaced about said spindle and pivotally mounted thereon, a grinding wheel center rotatably mounted on said bearing members, a grinding wheel mounted on said grinding

wheel center, the bearing surface of each of said bearing members having a radius less than that of the contacting surface of said wheel center, the pivot point on each of said bearing members being near to the trailing edge thereof so that a lateral movement of said grinding wheel caused by an increase in load thereon will cause each of said bearing members to move about said pivot so that the leading edge of each bearing member will be urged outwardly to counteract the lateral movement caused by a load on said grinding wheel.

4. In a grinding machine, a bed, a grinding wheel support mounted thereon, a spindle heaving one end mounted in said support, shoe type bearing members peripherally spaced and pivotally mounted on said spindle, a grinding wheel center rotatably mounted on said bearing members, a grinding wheel mounted on said grinding wheel center, said center having a grooved portion which serves as a pulley, said grooved portion being located between the grinding wheel and the grinding wheel support whereby power for rotating said wheel is applied at a point of maximum rigidity.

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