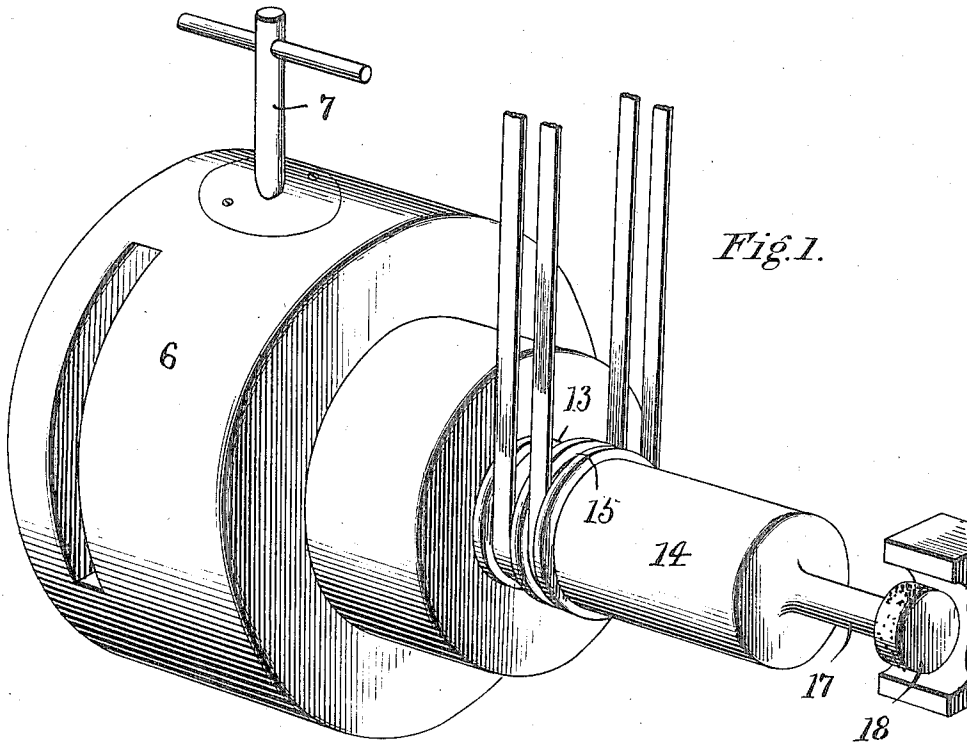
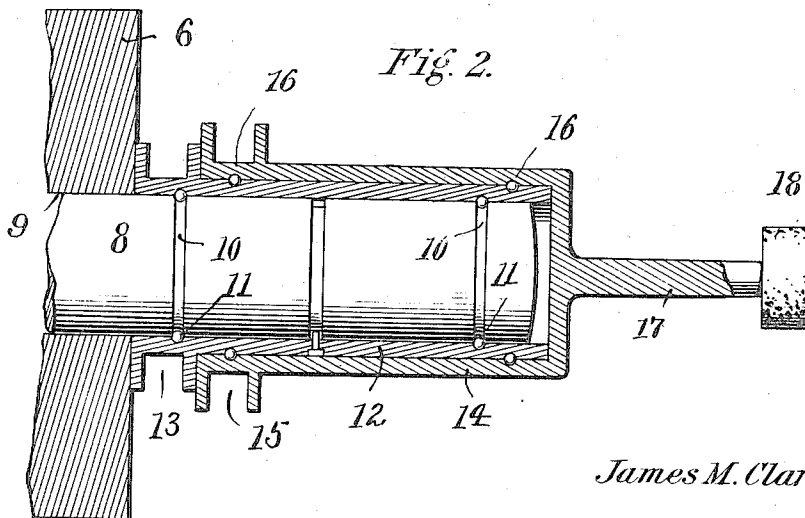


J. M. CLARK, 3D.
 FLOATING SPINDLE BEARING.
 APPLICATION FILED SEPT. 9, 1916.

1,229,414.

Patented June 12, 1917.
 2 SHEETS—SHEET 1.



Inventor
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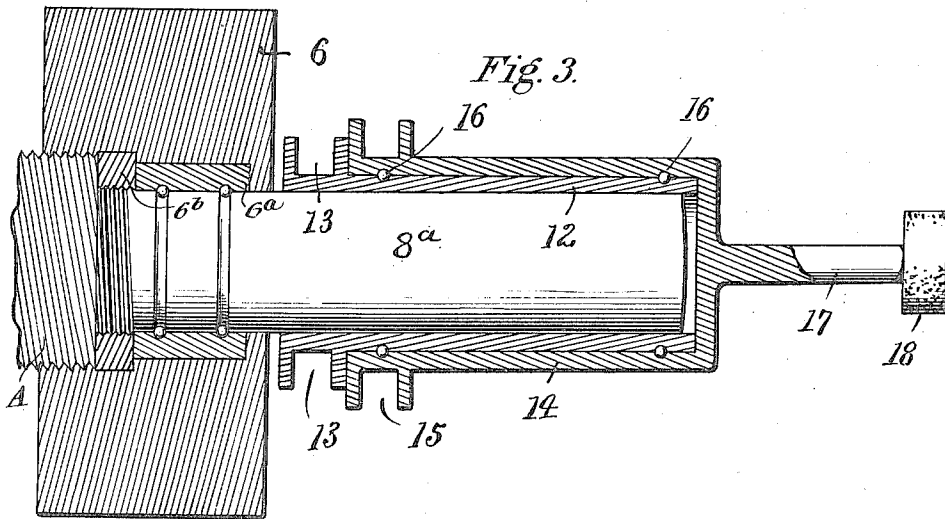
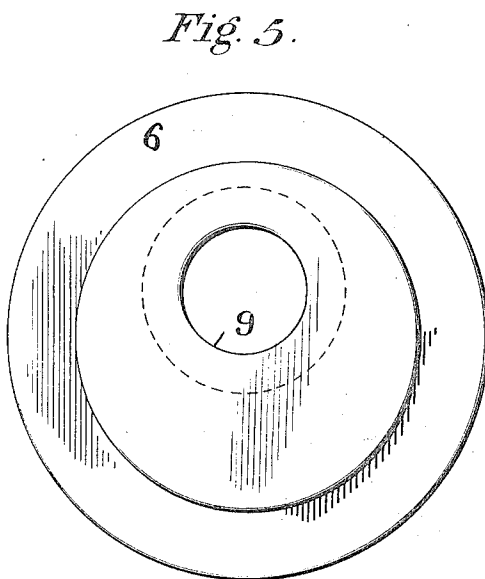
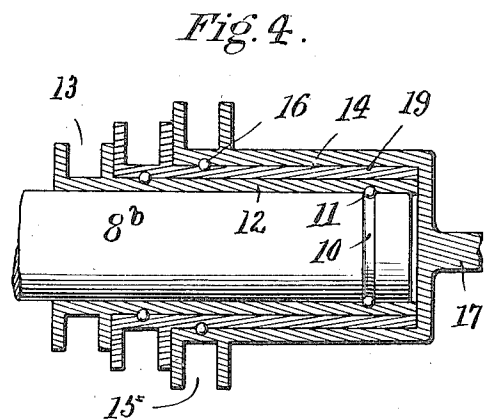
Attorney

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UNITED STATES PATENT OFFICE.

JAMES M. CLARK, 3d, OF BRIDGEPORT, CONNECTICUT.

FLOATING SPINDLE-BEARING.

1,229,414.

Specification of Letters Patent. Patented June 12, 1917.

Application filed September 9, 1916. Serial No. 119,258.

To all whom it may concern:

Be it known that I, JAMES M. CLARK, 3d, a citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Floating Spindle-Bearings, of which the following is a specification.

My invention relates to an improved form of floating spindle adapted for light high speed work such as driving cutters, grinders and the like, and particularly relates to what might be termed a multiple spindle one of which forms a bearing for the other.

The purpose of the invention is to produce a form of spindle construction whereby a grinder or cutter may be driven at a very much higher rate of speed than is practical to operate the present forms of spindles; to provide a form of construction wherein a shaft within a shaft is employed; one operating upon the other and adapted to be independently or collectively driven at the same or different speeds; to provide a form of bearing which is particularly adapted for attachment to and used in connection with the ordinary form of boring head such as is commonly employed upon machine tools of various types; and finally to provide a bearing which can be used to advantage in connection with either a straight form of boring head or an offset form of boring head both of which are commonly employed for holding the tools in machine work.

With these and other objects in view the invention resides and consists in the construction and novel combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departure from the spirit or sacrificing any of the advantages of the invention.

Similar characters of reference denote like or corresponding parts throughout the several figures of the accompanying drawings forming a part of this specification, and upon which,

Figure 1 shows a perspective view of a commercial type of boring head having my improved form of high speed spindle mount-

ed therein and including a grinding tool in its operative position.

Fig. 2 is a central vertical longitudinal section through the spindle and portion of the boring head shown in Fig. 1.

Fig. 3 is a similar sectional view illustrating a form of construction wherein the central solid spindle is designed to rotate within the boring head.

Fig. 4 shows a further modified form of construction in that two inner hollow shafts are employed instead of one as illustrated in the preceding figures, and

Fig. 5 shows a front end view of a boring head wherein the driving spindle is adapted to be carried off center.

Referring in detail to the characters of reference marked upon the drawings 6 indicates a boring head of the usual or any well known type with a key 7 positioned therein for locking the parts in position. In the form of construction shown in Figs. 1 and 2 this head is designed to carry a solid spindle 8 that is secured within a socket 9 of the head and projected forward to support the driving spindles and shafts mounted thereon. This fixed spindle may be provided with suitable grooves 10 that constitute ways for balls 11 and whereby a ball bearing is provided for the intermediate hollow shafts. The intermediate spindle designated as 12 is in the form of a hollow shaft and upon its inner end is formed a flanged belt wheel 13 by means of which the said shaft is rotated. This part of the bearing may be driven at a fixed rate of speed, say twenty-five hundred per minute and a similar rate of speed provided for the outer spindle 14, which like the inner spindle is provided with a separate belt wheel 15 and may be independently driven by a separate belt. Ball bearings 16 may be provided between the hollow spindles 13 and 14, if desired to reduce the friction. Thus it will be seen that while the outer spindle is turning at the rate of twenty-five hundred revolutions upon the inner spindle and the latter at the same rate upon the fixed spindle 8 that the outer spindle and its grinding wheel will turn at the rate of five thousand revolutions upon said fixed spindle which speed of rotation would otherwise not be permissible without heating, if it were turning upon a solid or fixed bearing. The end of the outer spindle is closed and includes a reduced extension 17 that serves to support

the grinding wheel 18 which can be substituted for the other form of cutters, if desired, as my invention is equally adapted for numerous other forms of work.

5 In the form of construction shown in Fig. 3 the boring head 6 is threadably secured to the threaded end of the arbor A. The spindle 8^a is mounted to turn within the boring head, being journaled in the block
10 6^a and secured against longitudinal movement by the nut 6^b secured thereto, while the intermediate and other shafts operate in the same manner as those shown in Figs. 1 and 2. The purpose of this construction is to
15 demonstrate the ability to apply the device upon a rotatable bearing and whereby a higher rate of speed may be obtained or the friction divided into three bearings instead of two.

20 In Fig. 4 I have sought to accomplish the same object but by using three hollow shafts 12, 14 and 19 instead of two. In this form of construction as well as the other forms the rotatable members are mounted upon a
25 fixed stud or spindle 8^b that may be secured in any kind of device and not necessarily a boring head. Three or a lesser number of belts may be used for driving the three operative parts of this bearing and would
30 thus serve to produce a bearing which is adapted to be driven very rapidly and the bearings therefore would be properly and equally divided into three distinct frictions. If a lesser number of belts were employed
35 the member not connected would be allowed to float and thus serves as an idler and in a measure accomplish somewhat the same purpose.

A spindle of this kind may be easily kept
40 lubricated in that the outer member or shaft is in the form of a cup and serves to inclose the outer parts keeping them dust proof and preventing the oil from flowing off therefrom.

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

1. In a high speed spindle bearing of the class described, the combination with a central spindle, of a hollow shaft rotatably
50 mounted thereon, an outer shaft mounted upon the hollow shaft and having an extended central shaft formed integral therewith, and means for independently driving
55 each of said shafts.

2. In a high speed spindle bearing of the class described, the combination with a central spindle, of a hollow shaft rotatably
60 mounted thereon and adapted to be independently operated, an outer shaft mounted

upon the hollow shaft and adapted to be independently driven and having an extended central shaft formed integral therewith, and a cutting tool carried upon the said extension.

3. In a high speed spindle bearing of the class described, the combination with a central spindle, of a hollow shaft inclosing the spindle and having an extended central shaft formed integral therewith, a cutting
70 tool carried upon the said extension, and one or more hollow shafts intermediate of said spindle and hollow shafts, and separate means for operating the intermediate shafts.

4. In a floating spindle bearing of the class described, the combination with a boring head, of a spindle carried thereby, a hollow shaft rotatably mounted thereon and adapted to be independently operated, an
80 outer shaft mounted upon the hollow shaft and having a closed end to inclose the spindle and hollow shaft and having an extension formed integral therewith, and a cutting tool carried upon the said extension.

5. In a high speed spindle bearing of the class described, the combination with a central spindle, of a hollow shaft rotatably mounted thereon, an outer shaft mounted
90 upon and inclosing the hollow shaft and having a central extension formed integral therewith and belt wheels mounted upon each of said shafts for operating the same.

6. In a floating spindle bearing of the class described, the combination with a boring
95 head, of a spindle carried thereby, a hollow floating shaft rotatably mounted thereon, an outer shaft mounted upon the hollow shaft and having a closed end to inclose the spindle and floating shaft and having
100 an extension formed integral therewith, and a cutting tool carried upon the said extension.

7. In a floating spindle bearing of the class described, the combination of a spindle
105 carried thereby, a hollow floating shaft rotatably mounted thereon, an outer shaft mounted upon the hollow shaft and having a closed end to inclose the spindle and floating shaft and having an extension formed
110 integral therewith, a cutting tool carried upon the said extension, and means for driving the outer shaft.

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 8th
115 day of September A. D., 1916.

JAMES M. CLARK, 3RD.

Witnesses:

C. M. NEWMAN,

RUTH M. W. KOGER.