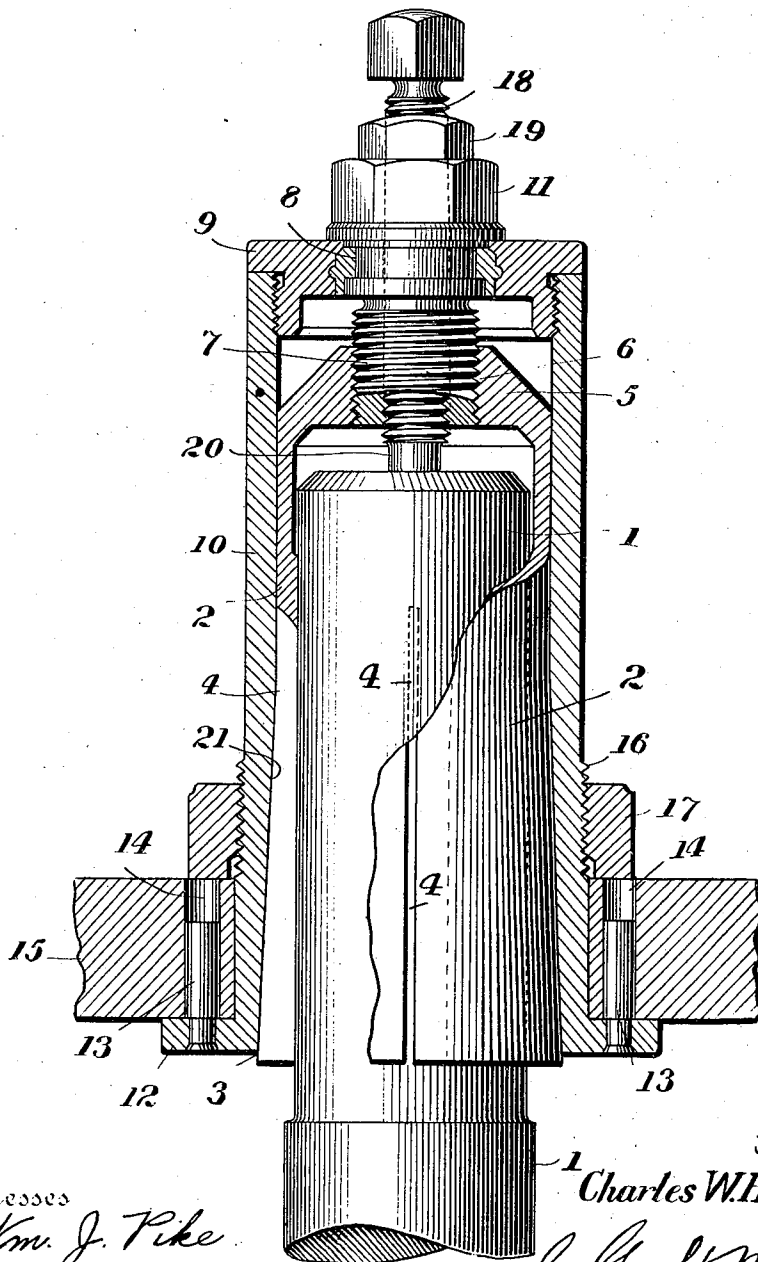


C. W. H. BLOOD.
 SELF CENTERING SUPPORT FOR ROTARY HEADS.
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1,166,408.

Patented Dec. 28, 1915.



Witnesses
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UNITED STATES PATENT OFFICE.

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SELF-CENTERING SUPPORT FOR ROTARY HEADS.

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Specification of Letters Patent.

Patented Dec. 28, 1915.

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To all whom it may concern:

Be it known that I, CHARLES W. H. BLOOD, a citizen of the United States, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Self-Centering Supports for Rotary Heads, of which the following description, in connection with the accompanying drawings is a specification, like letters on the drawings representing like parts.

In high speed machinery, and also in delicately adjusted machinery, the usual set screw means of tightening a pulley, cutter head or other rotary part onto the shaft often results in setting it out of true. The set screw tightening means operates at one side, and thereby distorts the tool or article which is being secured to the shaft, causing slack on one side and tightness on the other side. This is still further exaggerated wherever the hole of the tool or the spindle on which it is mounted is out of true, in which case the usual tightening means and the centrifugal force of operating at high speed tends to throw all the inaccuracy of the hole and spindle to one side, and continued use does not compensate for the wear of the hole and spindle but makes the error greater. Accordingly my invention aims to give perfectly true running regardless of the accuracy of fit or the diameter of the spindle or of the hole, and to greatly simplify and improve the construction of a device to automatically center and clamp the tool on the end of the spindle.

By my invention also the tightening of the head or tool on the shaft or spindle does not tend to change the position of said head or tool longitudinally on the shaft or spindle, my invention having the further advantage that, when desired, the tightening means can also be used as an adjusting means to position the head longitudinally on the shaft.

In high speed planing machines, especially, it is necessary to mount the cutter head firmly upon the end portions of cylinders or shafts, and my self-centering support and adjusting device is particularly intended for this class of work. I provide an open ended sleeve, having a substantially greater interior diameter than the exterior diameter of the spindle on which the head is to be clamped, and close one end of this sleeve by a threaded screw which carries a

rotatable member having a lower threaded portion adapted to engage the correspondingly threaded aperture of an expander also fitted over the end of the shaft. This expander is of appropriate wedge shape formation to fit between the shaft and exterior sleeve and clamp the same rigidly together, such expander being readily removable and a larger one substituted to provide for fitting the cutter head onto shafts of different diameters. Through the threaded rod connecting the outer sleeve with this expander, I fit a threaded shaft adapted to bear on the end of the shaft so that the whole device may be longitudinally adjusted thereon.

In the accompanying drawing, I have shown a preferred embodiment of the invention, the figure showing the mechanism mainly in central vertical section and partly in broken side elevation.

The shaft or spindle 1 may be of any size or construction and may extend longitudinally or vertically according to any given situation. On this shaft I mount a sleeve 2 having a tapered end 3 split or otherwise rendered contractible and expansible, being herein shown as having four longitudinal slits 4, said sleeve having an end or bridge 5 extending over the end of the shaft 1, threaded at 6 to receive a bolt 7 having shouldered engagement at 8 with the end 9 of a cap or shell-like support 10. The outer end 11 of the shouldered bolt 7 is shown as shaped like a nut to receive a wrench to turn it. Rotating this bolt tends to move the sleeve 2 within the cylindrical support 10, the thrust of the bolt being taken by the end of said support 10. At its opposite end said support is preferably provided with a flange 12 from which project pins 13 to enter holes 14 in the pulley, cutter head, or other tool 15, which, for lack of a better term, I will call a head, meaning thereby to include any such device which is to be carried by said shaft. This head is mounted directly on the support 10. Any suitable clamping means for securing the head in place may be provided, the support being herein shown as threaded at 16 and provided with a clamping nut 17. Preferably the bolt 7 is hollow and has threaded therein an adjusting bolt 18 provided with a check nut 19 to cause the same to turn normally with the bolt 7, said bolt 18 extending within the hollow sleeve to

bear at 20 against the end of the shaft 1. Preferably the inner surface 21 of the support 10 is conical to correspond to the taper of the sleeve 2. The end 9 of the support 10 is made in a separate piece merely as a matter of work-shop convenience, and to all intents is integral therewith.

In use the tool, wheel, or other device 15 is first clamped in position on the external support 10 and thereupon, in order to center and secure said wheel 15 with absolute precision, all that is necessary is to turn the bolt 11 forward to the right, thereby pulling the tapered sleeve inwardly against the correspondingly tapered inner surface 21 of the external support. This simultaneously centers the wheel 15 and clamps it rigidly to the shaft without any possibility of being set out of balance or distorted in any way. This gives perfectly true running regardless of the accuracy of fit or diameter of the shaft or of the hole of the wheel or other tool, inasmuch as this is compensated for by the expansible tapered sleeve. Also the height of the wheel, cutter head or the like, or its position along the shaft 1 is not changed in the slightest by the tightening and centering movement, inasmuch as the pull of the bolt 11 is transmitted directly to the external supporting member 10 and resisted by the central bolt 18 bearing on the shaft 1. On the other hand, if it is desired to change said position lengthwise of the shaft, this is readily accomplished by the same mechanism simply by turning the adjusting bolt 18. The pins 13 prevent any relative turning of the head 15. My invention permits a head or tool to be mounted

readily upon a larger or smaller shaft simply by substituting a thinner or thicker tapered sleeve 2.

It will be understood that my invention is capable of a comparatively wide range of embodiments without departing from the spirit and scope thereof.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

An automatic self-centering device of the kind described having clamping, adjusting, and centering means adapted to be applied to the end portion of a shaft, comprising an open ended cylindrical sleeve internally threaded at one end and outwardly flanged at the other end fitted about said shaft, a tapered split expander fitting between the shaft and sleeve with a threaded part inclosing the end of said shaft, and means to adjust said expander relatively with the shaft and sleeve to clamp and center the same, said adjusting means including a nut threaded into the end of sleeve, a rotatable bolt shouldered in said nut and adapted to turn therein and having threaded engagement with the threaded part of said expander, and an adjusting screw threaded through said bolt and bearing directly against the end of the shaft.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES W. H. BLOOD.

Witnesses:

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W. E. CHADBOURNE.