W. TATE.

ATTACHMENT FOR SHAPING MACHINES.

APPLICATION FILED MAR. 10, 1921.

1,435,758. Patented Nov. 14, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

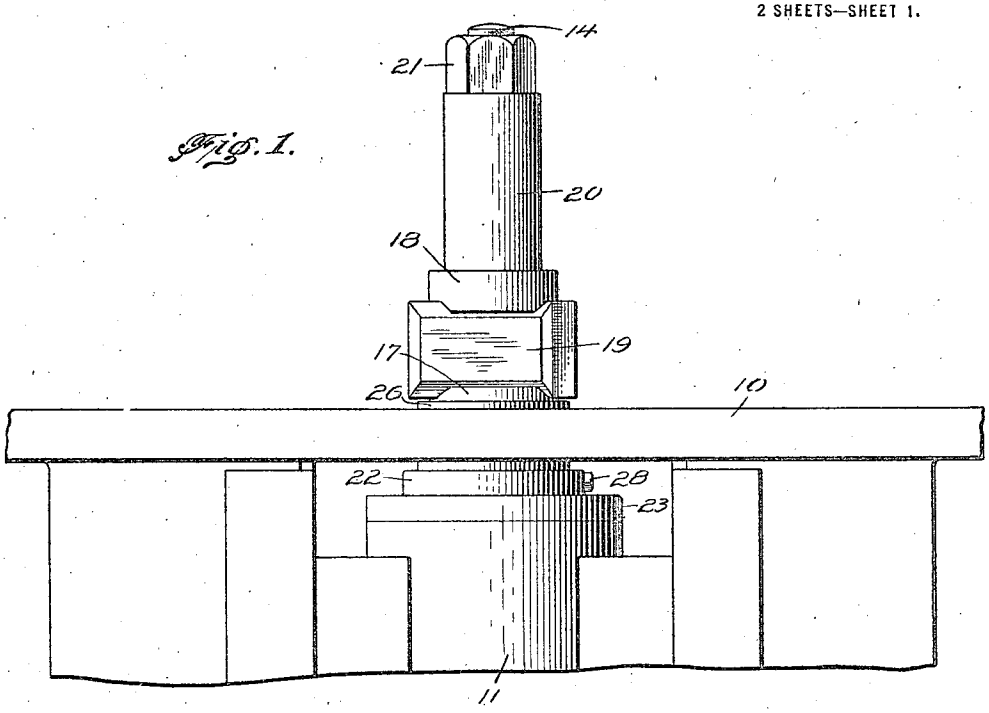


Fig. 2.

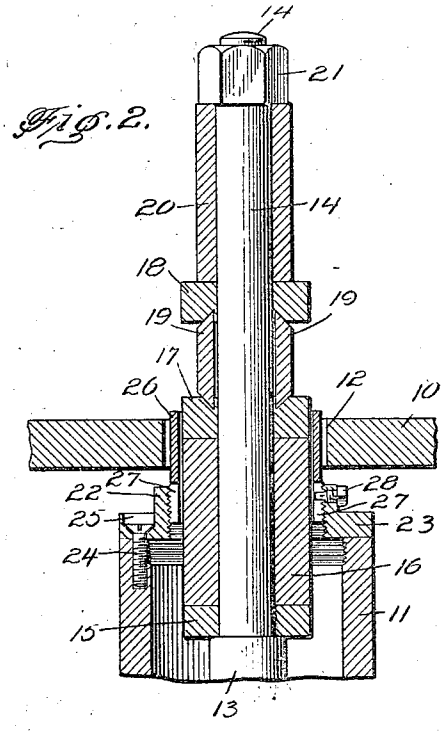


Fig. 3.

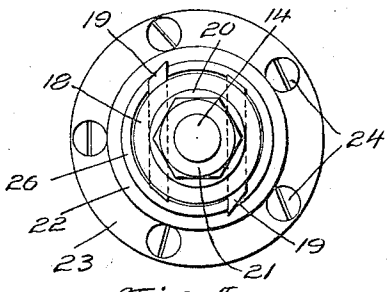
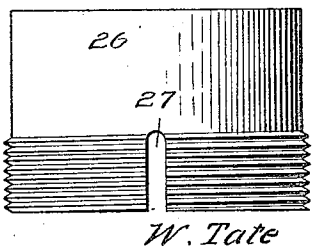


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

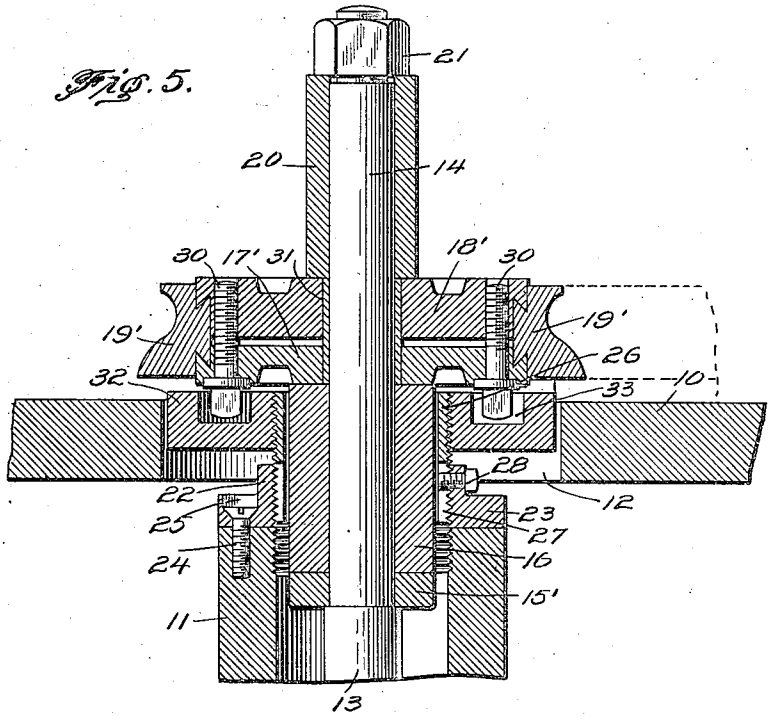
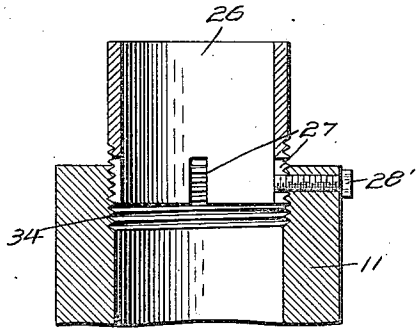


Fig. 6.



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UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR SHAPING MACHINES.

Application filed March 10, 1921. Serial No. 451,220.

To all whom it may concern:

Be it known that I, WILLIAM TATE, a citizen of the United States, residing at High Point, in the county of Guilford and State of North Carolina, have invented certain new and useful Improvements in an Attachment for Shaping Machines, of which the following is a specification.

This invention relates to improvements in shaping machines generally, more particularly to attachments for machines of the wood shaping type, and has for its object to provide an attachment for such machines, in a manner as hereinafter set forth, to overcome any disadvantages relative to the operation thereof and inaccuracies in the finished article due to excessive vibrations of the rotating cutters of tools.

Another object of the invention is to provide for such a means or attachment, and one which may be readily installed in position without any serious modifications in the present construction or arrangement of the parts of known types of machines, or the cutters or tools used therewith.

A further object of the invention is to provide a means or attachment of the character specified, and one capable of being adjusted throughout its comparatively wide range for use in conjunction with various sizes and types of cutters or tools of wood shaping machines.

With the foregoing, and other objects in view, the invention resides in the certain novel and useful construction and arrangement of parts as will be hereinafter more fully described, set forth in the appended claims, and illustrated in the accompanying drawings in which:—

Figure 1 is a fragmentary side elevation of the conventional form of a wood shaping machine embodying the preferred form of the present invention,

Fig. 2 is a fragmentary vertical section showing the cutter head and co-related parts thereof as of conventional form with the attachment associated therewith,

Fig. 3 is a top plan view of the cutter head and the co-related parts thereof with the attachment applied thereto, with the bed plate or table of the mechanism removed,

Fig. 4 is an elevation of the adjustable guide sleeve attachment for the cutter head of the machine,

Fig. 5 is a fragmentary vertical section similar to Fig. 2, but with a modified form of the invention associated with the cutter head thereof,

Fig. 6 is a fragmentary detail of a slightly modified method of supporting the attachment in position,

Referring to the drawings, wherein similar characters of reference designate corresponding parts in the several views thereof, the numeral 10 indicates the bed plate or work supporting table of a machine of conventional form, 11 a tubular housing rising vertically of the machines and having its upper end spaced below the lower face of the bed plate or table 10 and its bore in alinement with a circular opening 12 formed in the latter. Rising medially and concentrically of the tubular housing 11 is a shaft 13 having its upper end portion 14 of reduced diameter and projecting outwardly of the open end of the housing and passing concentrically upward through the circular opening 12 in the bed plate or table 10. In the construction shown in Figs. 1 to 3, inclusive, the co-related elements of the cutter head as operably assembled on the reduced end portion 14, of the shaft 13, generally consist of a lower spacing collar 15 fitted on the portion 14 and resting on the annular shoulder formed at the upper end of a larger shaft portion 13, a spacing sleeve 16 fitted on the shaft portion 14 and resting on the collar 15, a cutter collar 17 superposed on the upper end of the sleeve 16, and a second cutter collar 18 spaced above the collar 17 and passing therebetween cutters or tool elements 19, and a spacing sleeve 20 superposed on the upper face of the cutter collar 18, the entire cutter head formation being securely clamped together on the shaft end 14 by means of a nut 21 on the free threaded end thereof, the nut 21 being tightened into engagement with the upper end of the sleeve 20 for such purpose. In this type of machine, the adjustment of the cutters vertically with respect to the upper face of the bed plate 10 for operation on different thicknesses of work is generally accomplished by a means (not shown) operating to raise and lower the housing 11 and the shaft 13 carried by the same. Further adjustment of the cutters proper, or for the use of varying size cutters, is generally ac-

complished by providing interchangeable sleeves and collars, corresponding to the sleeves 16 and 20, and the collars 15, 17, and 18 of varying lengths or thicknesses, and assembling the same in any desired combination or order upon the shaft end 14.

In the type of the machine and cutter head formation as shown in Figs. 1 to 3, inclusive, the preferred form of the present invention is embodied therewith, and comprises an annular ring or member 22 having an annular flange 23 adapted to be supported in position concentrically of the upper end of the housing 11 and secured thereon in any suitable manner, or by means of machine screws 24, as shown, the heads of the latter preferably being disposed in counter sunk openings 25 formed in the annular flange 23. The inner diameter of the ring 22 is less than that of the inner diameter of the housing 11, but is of a greater diameter than the mean diameter of the collars and sleeves of the cutter head assembly, whereby to admit of the threading into its bore of a gauge or guide sleeve 26 adapted to be fitted over the cutter head assembly and to encircle the upper portion of the spacing sleeve 16 and the major lower portion of the lower cutter collar 17, the inner diameter of the gauge or guide sleeve 26 being sufficient only to allow the rotation therein of the opposed portions of the cutter head assembly without frictional contact therebetween. Depending upon the thickness and length of the lower collars and sleeves used, and of the heights of the cutters above the upper face of the bed plate or table 10, the gauge or guide sleeve 26 is raised or lowered correspondingly in the ring 22, and accurately positioned with its upper end spaced below the lower edge of the cutters 19 at a distance sufficient only to give desired or required clearance thereto for the cutting or shaping operation on the work. To assure of the guide sleeve 26 being retained in its adjusted position, the same is provided with a set of longitudinally disposed and elongated slots 27, which preferably open through the lower edge thereof and extend upwardly from the latter for a distance corresponding to the width of the threaded portion of the same. The slots 27, as shown, are four in number and are equi-distantly spaced one from the other, and the same are to be engaged by a set screw 28 threaded through a radially formed opening in the wall of the ring 22. By this arrangement of the slots 27 in the sleeve 26, the latter may be adjusted to extreme accuracy and nicety by quarter turn adjustments of the same with respect to the set screw 28, and securely held in desired adjusted position by the latter being engaged in the particular slot alined therewith.

In Fig. 5, there is shown a slightly modified form of the attachment which is designed for use in connection with larger and modified forms of known types of cutters than the one shown in Figs. 1 to 3, inclusive, and, in this instance, the collar 15′, and the sleeves 16 and 20 are made use of, and secured between the latter is a cutting element which consists of superposed circular clamp plates 17′ and 18′ adapted to be fastened together with suitable fastenings as screws 30, the peripheral edges of the plates 17′ and 18′ being provided with complementary formed recesses equidistantly spaced one pair from the other for the reception of the cutter elements 19′.

The central bore of the plates 17′ and 18′ is generally provided with a bearing sleeve 31 as shown. The attachment used in connection with this form of shaping cutter is of identical construction as in the first instance, except that the gauge or guide sleeve 26 is exteriorly threaded throughout its entire length, so as to have threaded onto its upper end a work, or work support, guide plate 32, which guide plate is circular in plan, and has an annular groove or channel 33 formed in its upper face, whereby to receive the heads of the screws 30 of the cutter element, and whereby the guide plate 32 can closely underlie the lower face of the latter. The plate 32 is threaded onto the sleeve 26 until its upper face is flush with the upper end of the latter, and this relation is to be maintained throughout the use of this type of machine, the adjustment of the plate 32 and sleeve 26 being made in the same manner as in the first form of the invention.

In the use of these large and heavy cutting elements, and the gauge or guide plate 32 associated therewith, the circular opening 13 formed in the bed plate or work table 10 must be of a greater diameter than that as in the machine shown in Figs. 1 and 2, and also slightly greater than that of the plate 32 which is movable vertically of the opening upon the raising and lowering of the housing 11 and the shaft 13 carried thereby, or during the adjustment of the sleeve 26.

In Fig. 6, a slightly different and more simple method of mounting the gauge or guide sleeve 26 is shown, and in this instance, the housing 11 is interiorly threaded, as at 33, and the sleeve 26 is threaded into the same, and is held in its adjusted position by means of a set screw 28′, which is threaded directly through the wall of the housing and into engagement with the particular slot of the sleeve 26 alined therewith.

In the operation of the machine of the type mentioned herein, it is customary to feed a length of wooden stock along the bed plate or table 10 at one side of the cutter or shaper, or to support the stock on a pattern block (not shown) for such purpose,

and, in the present instance, the stock or pattern block is movable past the cutter with its inner vertical face contacting the periphery of the gauge or guide sleeve 26, or the plate 32 carried thereby, after the latter have been properly adjusted upward through the circular opening 13 of the bed plate or work table 10, and, since the guide sleeve 26 or plate 32 does not rotate with the cutters, the stock is firmly maintained in position without the vibration of the cutter shaft 13 being transmitted thereto, and as the result thereof, the finished shaped edge of the stock is accurately cut and smooth throughout its extent, being otherwise free from all wavy or scored effects.

Upon the proper adjusting of the gauging or guide sleeve with respect to the cutters, a substantially rigid support or guide surface, against which the stock, or a supporting pattern, or carrier block, is pressed in its travel past the cutters, is provided whereby the stock is acted upon by the cutters without having transmitted thereto the vibration of the cutters and the shaft carrying the same, so that the finished surface on the stock is uniformly smooth and otherwise free from all wavy or scored defects, such as occur in the known practice.

It is also to be pointed out that, in the general practice of feeding stock to the cutters of wood shaping machines, wherein no rigid stationary guide is provided, such as the gauge and guide sleeves or plates forming the subject matter of the present case, the stock is necessarily forced against the periphery or peripheries of the rotating cutter clamping collars or plates with the result of producing friction therebetween which often causes burnt or scorched effects on the finished surface of the stock, or the guiding edge portions thereof, or of the stock support pattern or carrier block, as the case may be, and which is entirely eliminated in the use of the devices as herein provided.

From the foregoing, it will be readily apparent that the invention provides for a novel means for preventing free or excessive vibration of a normally free projecting end of the shaft 13 of the cutter head assembly carried thereby; for gauging the stock to be shaped with respect to the rotating cutters; for rigidly guiding the stock or a supporting pattern block in the path of the rotating cutters whereby to prevent the vibration of the shaft 13 and the cutters carried thereby producing a defective finished surface on the stock; and for accurately and minutely adjusting the gauge or guide sleeve or plate as and for the purposes set forth.

It is well understood, that, although the attachment has been shown and described herein in a specific application and terms, various changes in the detailed construction and arrangement of the parts of the same and other feasible modes of application to and association with any and all types of shaping and other similar machines may be resorted to without departing from the spirit and scope of the invention.

Having thus fully described the invention, what is claimed, is:—

1. In a wood shaping machine, the combination with a bed plate having a circular opening therein and a housing disposed beneath the bed plate in alignment with the circular opening, of a driven shaft within said housing and having its free end projecting upwardly through the circular opening in the said bed plate, a cutter head assembly carried on the projecting end of said shaft, an annular support removably secured on the upper end of said housing and angle shaped in cross section, and an adjustable sleeve having its lower portion provided with peripheral threads for engagement with the inner face of said support, said sleeve encircling said cutter head assembly below the cutters thereof for gauging and guiding the stock in its travel past the cutters, and means carried by said support and engaging the lower portion of the sleeve for maintaining it in adjusted position.

2. An attachment for wood shaping machines comprising an annular interiorly threaded support, a peripherally threaded adjustable sleeve engaging the threads of said support and adapted to encircle a cutter head assembly below the cutters thereof for gauging and guiding the stock in its travel past the cutters of the head, said sleeve formed with vertically disposed slots, and shiftable means carried by said support and co-acting with said slots for maintaining said sleeve in adjusted position.

3. An attachment for wood shaping machines comprising an annular support, an adjustable sleeve connected to said support and adapted to encircle a cutter head assembly below the cutters thereof for gauging and guiding the stock in its travel past the said cutters, said sleeve formed with vertically disposed slots, and shiftable means carried by said support and cooperating with the slots of the sleeve for retaining the latter in any of its adjusted positions with respect to the cutters.

4. In a wood shaping machine, the combination with a bed plate having a circular opening therein and a housing disposed beneath the bed plate in alinement with the circular opening thereof, of a driven shaft within the said housing and having its free end projecting upwardly through the circular opening in the said bed plate, a cutter head assembly carried on the projecting end of said shaft, an annular support removably secured on the upper end of said housing, and a sleeve having threaded engage-

ment with the inner face of said support and encircling said cutter head assembly below the cutters thereof for gauging and guiding the stock in its travel past the said cutters.

5. In a wood shaping machine, the combination with a bed plate having a circular opening therein and a housing disposed beneath the bed plate in alinement with the circular opening thereof, of a driven shaft within the said housing and having its free end projecting upwardly through the circular opening in the said bed plate, a cutter head assembly carried on the projecting end of said shaft, an annular support removably secured on the upper end of said housing, an adjustable slotted sleeve connected with said support and encircling said cutter head assembly below the cutters thereof for gauging and guiding the stock in its travel past the said cutters, and means carried by said support and cooperative with said slots for securing said sleeve against accidental displacement from any of its adjusted positions with respect to the said cutters.

6. In a wood shaping machine, the combination with a bed plate having a circular opening therein and a housing disposed beneath the bed plate in alinement with the circular opening thereof, of a driven shaft within the said housing and having its free end projecting upwardly through the circular opening in the said bed plate, a cutter head assembly carried on the projecting end of said shaft, an annular support removably secured on the upper end of the said housing, an adjustable sleeve having threaded engagement with the inner face of said support and encircling said cutter head assembly below the cutters thereof for gauging and guiding the stock in its travel past the said cutters, and a set screw carried by said support and adapted for engagement with said sleeve for retaining the same in any of its adjusted positions with respect to the said cutters.

7. In a wood shaping machine, the combination with a bed plate having a circular opening therein and a housing disposed beneath the bed plate in alinement with the circular opening thereof, of a driven shaft within the said housing and having its free end projecting upwardly through the circular opening in the said bed plate, a cutter head assembly carried on the projecting end of said shaft, an annular support carried at the upper end of said housing, a sleeve adjustably mounted in said support and encircling said cutter head assembly beneath the cutters thereof, an annular member carried by the upper end of said sleeve for gauging and guiding the stock in its travel past the said cutters, and means for retaining said sleeve against accidental displacement from any of its adjusted positions with respect to the said cutters.

8. In a wood shaping machine, the combination with a bed plate having a circular opening therein and a housing disposed beneath the bed plate in alinement with the circular opening thereof, of a driven shaft within the said housing and having its free end projecting upwardly through the circular opening in the said bed plate, a cutter head assembly carried on the projecting end of said shaft, an annular support carried at the upper end of said housing, a sleeve adjustably mounted in said support and encircling said cutter head assembly beneath the cutters thereof, a removable annular member carried by the upper end of said sleeve for gauging and guiding the stock in its travel past the said cutters, and means for retaining said sleeve against accidental displacement from any of its adjusted positions with respect to the said cutters.

In testimony whereof, I affix my signature hereto.

WILLIAM TATE.