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CUTTER HEAD SETTING AND GAGING DEVICE AND STAND.
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Fig. 1.

Fig. 3.

Fig. 2.

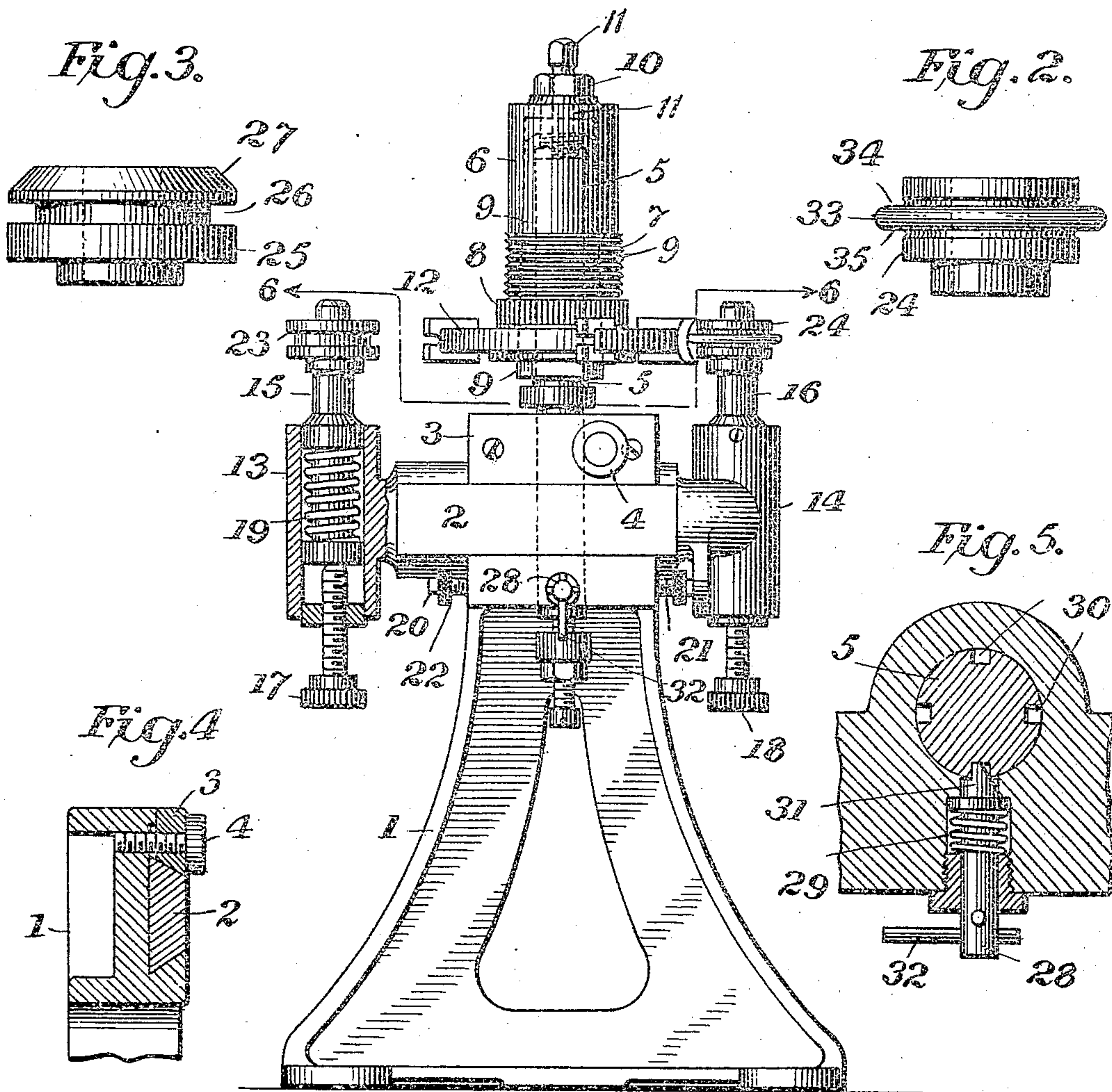
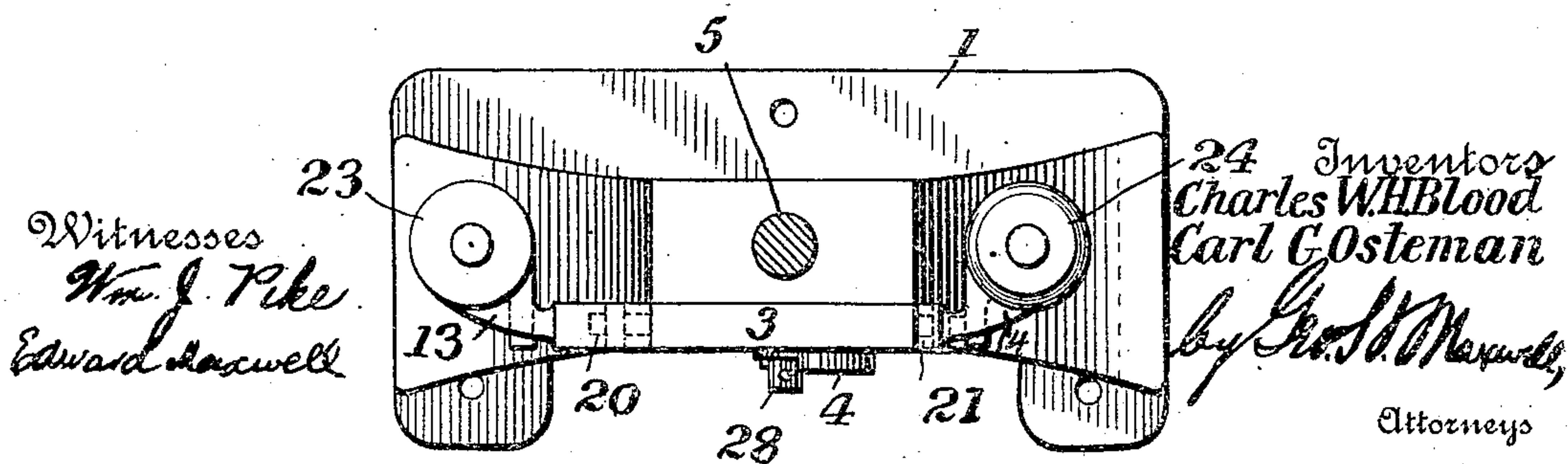


Fig. 4.

Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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CUTTER-HEAD SETTING AND GAGING DEVICE AND STAND.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHARLES W. H. BLOOD, a citizen of the United States, and resident of Winthrop, in the county of Suffolk and State of Massachusetts, and CARL G. OSTEMAN, a citizen of the United States, and resident of Dorchester, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Cutter-Head Setting and Gaging Devices and Stands, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

The object of our invention is to provide exceedingly sensitive and accurate means for setting and for gaging the cutters of a cutterhead.

Also further features of our invention provide an apparatus especially adapted for setting and gaging matcher heads or other vertical cutterheads.

Preferably we employ a roll carried by a movable holder for cooperating with the cutters of the cutterhead. When a cutter touches the roll the latter tends to move, and we have found that the minutest degree of inaccuracy in the cutter can be felt by means of this sensitive responsiveness of the roll, so that our mechanism enables us to detect by sense of feeling, the very smallest errors in setting or in adjustment. This applies equally to the adjustment of the cutters in and out and also transversely.

A further feature of our invention resides in providing a roll having an edge surface the exact duplicate in shape of the edge of the stock, so that thereby the grooving cutters for instance, or the tonguing cutters can be accurately set or gaged at their upper and lower cutting edges.

Our invention includes various other features which will be pointed out in the description and claims.

In the drawings we have shown a preferred embodiment of our invention.

Figure 1 shows the machine in front elevation; Figs. 2 and 3 are views in side elevation of two forms of gaging and setting rolls; Fig. 4 is a sectional detail taken vertically at the pin 4, Fig. 1; Fig. 5 is a sec-

tional detail of a step-by-step device for holding the cutterhead spindles; and Fig. 6 is a top plan view of the stand and slide in operative relation.

On a suitable stand 1 is mounted a transverse slide 2 dovetailed in cross section and adjustably held by a clamping plate 3 actuated by a threaded clamping pin 4, while extending upwardly from said stand is a spindle or shaft 5 on which is mounted a holding cap or sleeve 6 threaded at 7 to receive a clamping nut 8, and between the shaft 5 and cap or sleeve 6 is a taper sleeve 9 actuated by a bolt 10 against the resistance of a bolt 11 for accurately centering a cutterhead such, for instance, as indicated at 12, to be then clamped by the nut 8. At its opposite ends the slide 2 is provided with similar journal bearings 13, 14, deflected rearwardly sufficiently to bring their centers into alinement with the shaft 5, see Fig. 6, in which are supported stub shafts or spindles 15, 16, adjusted by hand screws 17, 18, respectively, which bear against the lower ends of said shafts in opposition to springs 19. Cooperating with these end members or journal bearings 13, 14, are opposite stops 20, 21, threaded at their inner ends in the stand, to be rotated independently by knurled shoulders or nuts 22.

Secured to the stub shafts 15 and 16 are gaging and setting rolls having a peripheral contour corresponding accurately to that of the edge or surface of the stock when planed, the roll 23, as herein shown, corresponding to the grooved edge of a board, and the roll 24 to the tongued edge of a board, the latter being shown in further detail in Fig. 2, while in Fig. 3 we have shown a roll corresponding to the edge of a board provided with a usual groove 26 and having an adjacent beveled edge 27. We show this roll simply to indicate more clearly the fact that our invention is applicable to any and all shapes or contours, it being understood that the required roll is simply placed on the stub shaft 15 or 16 in the operative position shown in Fig. 1 whenever it is desired to set or gage a cutterhead for cutting that particular pattern. Preferably the holding spindle 5 is positively positioned, a bolt or

locking pin 28 normally held inward by a spring 29 being shown as adapted to lock into grooves or notches 30 in the lower end of said shaft. Said pin preferably has one edge beveled at 31 so as to permit the shaft and cutterhead to be rotated in one direction, a handle 32 being provided for turning said locking pin so as to permit the shaft to be rotated in the other direction when desired.

One purpose of this locking pin is to enable the operator to know when a given cutter is brought into correct position with reference to the adjacent truing roll or device as 24. The pin notifies the operator by its clicking sound and also by its halting effect on the spindle and cutterhead.

We have described our invention in its various details of embodiment as herein shown in the preferred form, although it will be understood that we do not intend to limit our invention to this construction as it is capable of a wide range of embodiments.

In use, the operator, having clamped the cutterhead in accurately centered position on the spindle or shaft 5 to correspond exactly to its position in a planer, accurately adjusts the adjacent stop 20 or 21 so as to stop the adjacent roll in true centering or gaging position. Thereupon the proper roll is put into position on its shaft 15, 16, and the slide 2 is moved longitudinally until the end 13 or 14, as the case may be, strikes against the adjacent stop. Thereupon the slide is clamped immovably by turning the hand bolt 4. Let it be supposed that the machine is to set or gage a cutterhead for cutting a tongued edge of the board in accordance with the roll 24. The spindle 16 having been accurately adjusted vertically by the hand screw 18 until the tongue 33 is in the desired accurate position, the cutterhead is turned so as to bring a cutter into coöperation with said roll 24. If the cutter is too far forward it will be crowded back into accurate position by its engagement with the roll 24. If it is too low the correct amount which it must be raised will be indicated by the upper surface 34 of said projecting portion 33, and if it is too high the correct position will be indicated by the opposite under surface 35. In the preferred embodiment of our invention the roll will crowd the cutter into proper position and this result is accomplished for each cutter in succession merely by rotating the shaft 5 step-by-step, the pin 28 serving to halt the cutterhead at the right instant when its edge is in the plane which includes the axes of the two shafts 5, 16, said locking pin or latch also serving to hold the head so as to permit the knife or cutter to be tightened or loosened. If it is merely desired to test or gage the cutterhead our apparatus permits this to be

done with extreme rapidity as well as accuracy, inasmuch as the slightest contact of a cutter with the adjacent roll enables the operator to feel the same through his grasp of the roll. By having the gage roll exactly the same in edge contour and size as the lumber, all the cutters are readily brought into the desired planes. It is customary to set part of the blades to cut against the upper side of the wood (for a tongue or groove) and the other blades to cut against the under side, and this result is accurately and quickly accomplished simply by having the gaging roll correspond exactly to the required edge-shape of the lumber. The roll can be used for gaging, *i. e.*, testing whether the cutters are set correctly in the head and also can be used for setting *i. e.*, itself moving the cutters if incorrect. It will be understood that the term "roll" includes any swinging device having a sector shape, whether a complete roll or not, and by the terms "tongue" and "groove" we mean to include any forwardly projecting swinging angular surface and any rearwardly extending angular surface, as, for instance, not only 26, but also 27. It will be understood that while we prefer a roll, certain of our claims hereinafter contained, are not restricted thereto, and the same remark applies to the various other details of construction.

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

1. In an apparatus of the kind described, a stand, a slide mounted to slide transversely across said stand, means to mount a cutterhead to rotate on said stand intermediate the ends of said slide, and gaging devices carried at the opposite ends of said slide at a distance apart greater than the diameter of the cutterhead and in position to engage alternately said cutterhead according as the slide is moved lengthwise in one direction or in the other.

2. In an apparatus of the kind described, a stand, a slide mounted to slide transversely across said stand, means to mount a cutterhead to rotate on said stand intermediate the ends of said slide, gaging devices carried at the opposite ends of said slide at a distance apart greater than the diameter of the cutterhead and in position to engage alternately said cutterhead according as the slide is moved lengthwise in one direction or in the other, and adjustable stop means to limit the longitudinal movement of the slide with reference to the cutterhead.

3. In an apparatus of the kind described, a stand, a slide mounted to slide transversely across said stand, means to mount a cutterhead to rotate on said stand intermediate the ends of said slide, and gaging devices carried at the opposite ends of said slide

at a distance apart greater than the diameter of the cutterhead in the same plane with the axis of the means on which the cutterhead is mounted, and in position to engage alternately said cutterhead according as the slide is moved lengthwise in one direction or the other.

4. In an apparatus of the kind described, a stand, a slide mounted to slide transversely across said stand, means to mount a cutterhead to rotate on said stand intermediate the ends of said slide, rotary gaging devices carried at the opposite ends of said slide at a distance apart greater than the diameter of the cutterhead and in position to engage alternately said cutterhead according as the slide is moved lengthwise in one direction or in the other, and adjustable stop means to limit the longitudinal movement of the slide with reference to the cutterhead.

5. In an apparatus of the kind described, a stand, a shaft mounted in said stand, an externally threaded sleeve centered on said shaft to receive a cutterhead, a clamping nut having threaded engagement with said sleeve for clamping said cutterhead to rotate with relation to said stand, and a gaging device carried by said stand in position to gage the cutters in said cutterhead as the latter is rotated.

6. In an apparatus of the kind described, a stand, a shaft mounted in said stand, an externally threaded sleeve centered on said shaft to receive a cutterhead, a clamping nut having threaded engagement with said sleeve for clamping said cutterhead to rotate with relation to said stand, a gage roll and its supporting means carried by said stand to gage the cutters in said cutterhead including means to adjust said roll transversely of said cutters and means to adjust said roll longitudinally of said cutters.

7. In an apparatus of the kind described, a stand, a shaft mounted in said stand, an externally threaded sleeve centered on said shaft to receive a cutterhead, a clamping nut having threaded engagement with said sleeve for clamping said cutterhead to rotate with relation to said stand, a gage roll carried by said stand, a tubular bearing in which said gage roll is journaled parallel to said shaft, a spring in said tubular bearing tending to move said roll in one direction, and slow-motion adjusting means for moving said roll in an opposite direction.

8. In an apparatus of the kind described, a stand, a shaft mounted in said stand, an externally threaded sleeve centered on said shaft to receive a cutterhead, a clamping nut having threaded engagement with said sleeve for clamping said cutterhead to rotate with relation to said stand, a gage

roll carried by said stand, and yielding locking means yielding to permit the cutterhead to be rotated step by step in one direction and to prevent rotation thereof in an opposite direction, said locking means being arranged to halt the cutterhead when a blade thereof is opposite the gage roll.

9. In an apparatus of the kind described, a stand, a shaft mounted in said stand, an externally threaded sleeve to receive a cutterhead, centering means centering and clamping said sleeve on said shaft, said shaft and sleeve being rotatable together, a clamping nut having threaded engagement with said sleeve for clamping said cutterhead, and a gaging device carried by said stand in position to gage the cutters in said cutterhead as said shaft is rotated.

10. In an apparatus of the kind described, means for supporting a cutterhead in position to have its cutters gaged and set, and gaging and setting means comprising a rotary gaging device having an angular gaging edge to correspond to the shape of the cutters, and adjusting mechanism for adjusting said rotary device transversely of said cutterhead, said cutterhead supporting means including clamping means to maintain said cutterhead in an unvarying predetermined axial position, whereby said angular edged rotary gaging device and said cutterhead cooperate accurately for each cutter of the latter.

11. In an apparatus of the kind described, means for supporting a cutterhead in position to have its cutters gaged and set, and gaging and setting means comprising a rotary gaging device having an angular gaging edge to correspond to the shape of the cutters, adjusting mechanism for adjusting said rotary device transversely of said cutterhead, said cutterhead supporting means including clamping means to maintain said cutterhead in an unvarying predetermined axial position, whereby said angular edged rotary gaging device and said cutterhead cooperate accurately for each cutter of the latter, said cutterhead supporting means being normally free to rotate with relation to said rotary gaging device, and means for automatically holding said cutterhead stationary when being gaged by said gaging device, whereby the operator is free to tighten or loosen the cutters as required by said gaging device.

12. In an apparatus of the kind described, means for supporting a cutterhead in position to have its cutters gaged and set, and gaging and setting means comprising a rotary gaging device having an angular gaging edge to correspond to the shape of the cutters, and adjusting mechanism for adjusting said rotary device transversely of and also to and from said cutterhead, said

cutterhead supporting means including
clamping means to maintain said cutterhead
in an unvarying predetermined axial posi-
tion, whereby said angular edged rotary
5 gaging device and said cutterhead coöperate
accurately for each cutter of the latter.

In testimony whereof, we have signed our

names to this specification, in the presence
of two subscribing witnesses.

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Witnesses:

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