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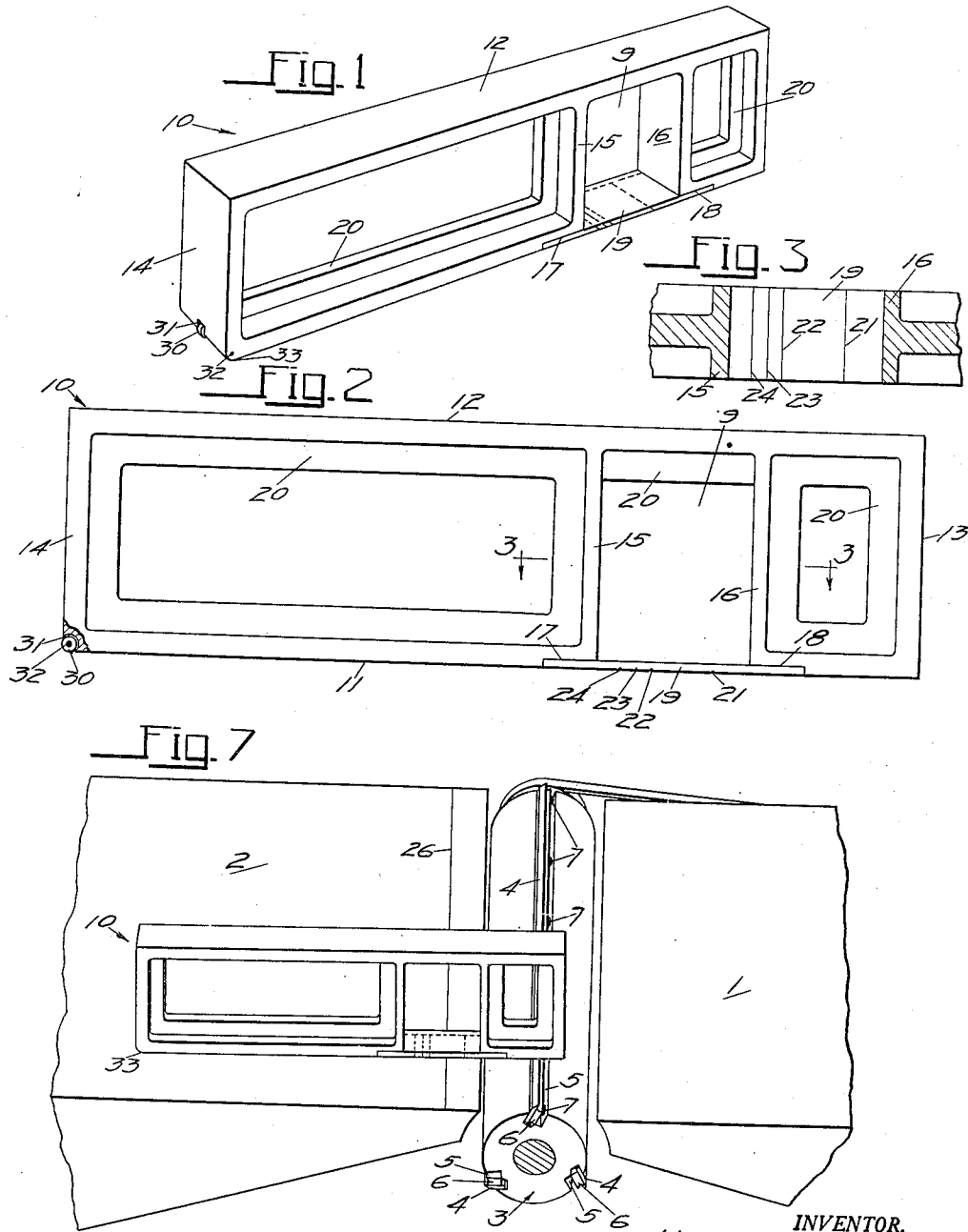
H. S. BEALE

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GAUGE FOR SETTING JOINTER KNIVES AND METHODS

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2 Sheets-Sheet 1



INVENTOR.
HOWARD S. BEALE

BY
Boyken, Mohler & Beckley.

ATTORNEYS

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H. S. BEALE.

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Fig. 4

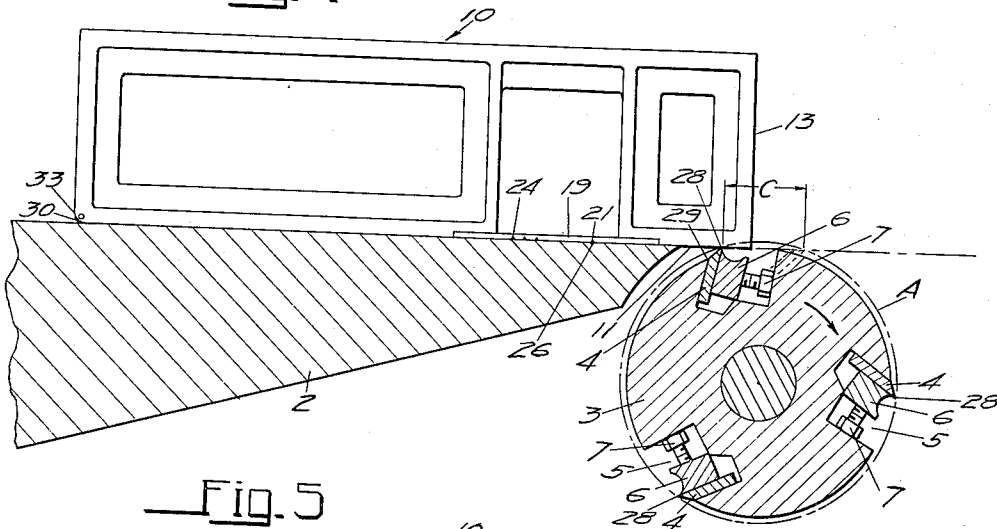


Fig. 5

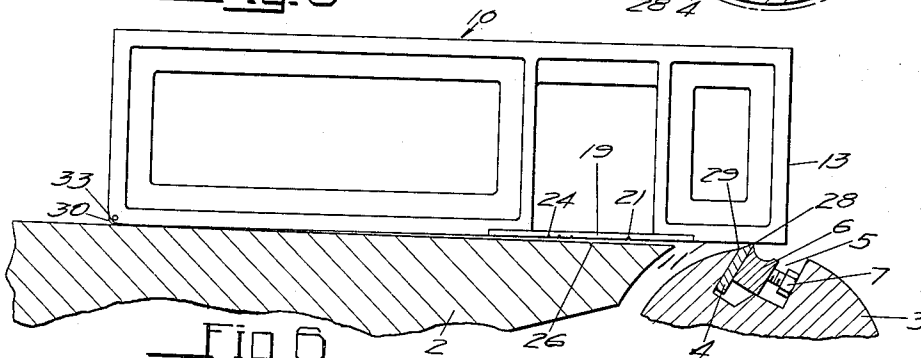
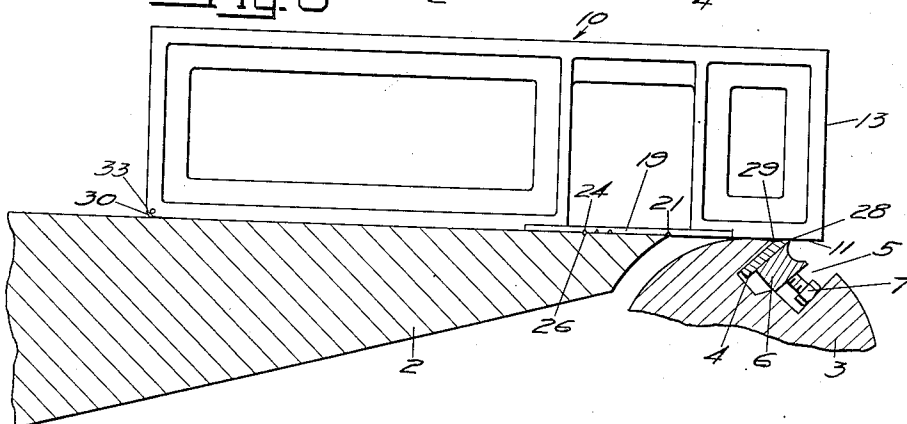


Fig. 6



INVENTOR.
HOWARD S. BEALE

BY
Boylan, Mohler & Beckley.

ATTORNEYS

UNITED STATES PATENT OFFICE

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GAUGE FOR SETTING JOINTER KNIVES
AND METHODS

Howard S. Beale, San Francisco, Calif.

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5 Claims. (Cl. 33—185)

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This invention relates to a device for setting the knives of a jointer relative to the cutter head in which said knives are secured.

The problem of properly setting the knives in a jointer is one which has not heretofore been satisfactorily solved. Many different methods have been proposed, but none to my knowledge has proven satisfactory.

When the knives in a jointer have been properly "set" the cutting edge of each knife is exactly parallel to the axis of the cutterhead and each of the three knives has the same cutting circle. The knives must be set properly after each sharpening and the difficulty attending the setting process has led many jointer users to send the entire cutter head to the manufacturers, along with the knives, for sharpening and resetting. This is not only an expensive procedure but may result in the loss of the jointer for long periods of time.

Other jointer users, fearful of not being able to set the knives properly, try to use the original knives of the jointer after the same have become dull and dented. This results in poor work and reduces the value of the machine, which value is directly proportional to its precision.

In the past, various methods of setting jointer knives have been proposed. One requires the use of a heavy magnet which is placed on the rear table of the jointer with the poles of the magnet overhanging said table and directly above the cutter head. An index mark is then scribed on the magnet and each knife is successively pulled up to the magnet and locked in place. The main disadvantage of this procedure lies in the difficulty of getting the magnet in the proper position relative to the knives, and even when properly positioned, inaccuracies result. Basically, such a method is unsound because the actual cutting circle of the knives is not measured but rather the radial distance of the knife edge from the axis of the cutter head. Inasmuch as the latter distance is relatively short, slight inaccuracies in measurement are greatly magnified when the device is in use, and this is especially so when it is considered that a difference of .001" in the radius of the cutting circle of two knives will result in poor work.

Other methods based on the same principle as the "magnet method" have been attempted in the past but the same have not proven satisfactory.

The main object of the present invention is therefore the provision of a gauge for setting jointer knives which overcomes the disadvantages of prior art processes.

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Another object of the invention is the provision of a novel method for setting jointer knives and by which method the greatest possible accuracy is achieved.

Still another object of the invention is the provision of a simple and inexpensive gauge which may be employed by relatively unskilled users and which gauge is fool-proof in operation.

Other objects and advantages will be apparent from the following specification and drawings.

Fig. 1 is a perspective view of the invention.

Fig. 2 is a side elevational view of the invention partly broken away and in section to show structure.

Fig. 3 is a fragmentary horizontal cross-sectional view of the setting gauge of Fig. 2 as taken along lines 3—3 of Fig. 2.

Fig. 4 is a semi-schematic transverse cross-sectional view of the cutter head showing the gauge positioned on the rear table of the jointer and with one of the cutter knives engaging the gauge.

Fig. 5 is a semi-schematic view similar to Fig. 4 but showing one end of the gauge raised by the knife.

Fig. 6 is a semi-schematic view similar to Figs. 4 and 5 but showing the knife just before it is disengaged from the setting device.

Fig. 7 is a semi-schematic perspective view of a jointer showing the knife setting gauge in the position of Fig. 5.

In detail, the invention is adapted to be used in connection with a conventional jointer having a front table 1, a rear table 2 and a cutterhead 3 between said front and rear tables (Fig. 7). Cutterhead 3 is a generally elongated cylindrical member and is provided with three axially extending knives 4 secured at circumferentially spaced points around said cutterhead and projecting generally radially outwardly therefrom. The knives 4 are about equal in length to the length of the cutterhead 3. In operation, it will be understood that the rear table 2 is secured in a position with the plane of the upper surface of said table tangent to the cutting circle of the knives 4 and with the front table spaced below the rear table a distance equal to the desired depth of cut to be made. When a piece of wood is fed from the front table to the rear table with the lower surface of the wood sliding on the front table the rapidly rotating knives 4 cut away all of the wood below the plane of the rear table.

The term "cutting circle" as used herein may be defined as the locus of the cutting edges of the knives 4 during rotation of the cutterhead 3.

It will be apparent that the cutting circle of each knife must coincide with the cutting circles of the other two knives in order to plane the work smoothly. The present invention is adapted to achieve this result.

Each knife 4 is secured in a slot 5 which extends the length of the cutterhead and is of suitable cross-section to receive the knife 4 and an elongated chipper bar 6 which is positioned alongside the knife 4 and in engagement therewith. A plurality of bolts 7 are threadedly secured to chipper bar 6 at spaced points along the length of the latter with their shanks projecting from the side of chipper bar 6 opposite the side which engages the knife 4. By tightening the heads of bolts 7 against the adjacent side of slot 5 the knife 4 is firmly secured in said slot.

The present invention comprises an elongated generally rectangular hollow body generally designated 10 (Figs. 1, 2) and having a base or bottom wall 11, a top wall 12 and front and rear end walls 13, 14 respectively.

The body 10 is relatively thin in comparison with its length so that the body engages only a very short section of the length of the knife to be set. The height of body 10 between the top and bottom walls 12, 11 is preferably between two and three times its width so as to make the body very rigid and at the same time heavy enough to be positively engaged by the knives of the jointer in a manner to be described.

Between the endwalls 13, 14 are a pair of longitudinally spaced transverse ribs 15, 16 respectively, which extend between top and bottom walls 12, 11. Between ribs 15, 16, bottom wall 11 is removed so as to provide a downwardly opening recess 9. Bottom wall 11 is slotted as at 17, 18 to receive the opposite ends of a transparent scale 19 of glass or plastic. This scale 19 may be rigidly secured to bottom 11 by any desired method such as cementing. Reinforcing webs 20 may be formed integral with the walls of body 10 and the ribs 15, 16 as desired (Figs. 1, 2, 3).

Adjacent the end of scale 19 that is nearer endwall 13 the same is scribed with a transverse line 21 (Fig. 3). At a point spaced a predetermined distance along scale 19 from line 21 is another line 24 for a purpose to be described. The distance between lines 21 and 24 represents the distance between the two points at which the cutting circle of a properly set knife intersects the plane of the rear table when the latter is substantially tangent with the rear table. This will be more fully described in the following description of the operation of the gauge.

In operation, the first step in setting the knives is to adjust the height of the rear table until the upper surface of said table is positioned substantially tangent to the upper surface of the cutter head (Fig. 4). This may be readily accomplished by disposing the gauge on the rear table with the front endwall 13 overhanging the cutter head so that the cutter head just clears the bottom 11 of the gauge. The rear table is then secured in place and is not moved until the knife setting operation is completed.

With the gauge 10 in about the position of Fig. 4 a line 26 is scribed on the rear table 2 parallel with the axis of cutterhead 2 and coincident with line 21 on scale 19 (Fig. 7). This line 26 may be scribed with a sharp pointed instrument and should be very fine so as not to impair the rear table. However, if desired the line may be temporary in which case a hard pencil may be used. Referring again to Fig. 4, the gauge 10 is then

disposed on the rear table with the line 21 on scale 19 coinciding with the line 26 scribed on rear table 2; the cutterhead 3 is then slowly rotated by hand in the normal direction indicated by the arrow in Fig. 4 until the edge of knife 4 engages the bottom wall 11 of gauge 10. In this connection it should be noted that the gauge body is preferably made of aluminum or other soft material so that the knife edge 28 will not slip thereon. It will also be understood that the knife 4 being recently sharpened will be imbedded very slightly in the bottom wall 11 thus overcoming any tendency for the knife to slip on the gauge.

Upon continued rotation of cutterhead 3 from the position of Fig. 4 the knife edge 28 will raise the front end of the gauge and drag the rear end along rear table 2 until the knife edge 28 passes below the plane of the rear table at which time the knife edge 28 will be disengaged from the bottom wall 11 and the gauge 10 will come to rest in a position closer to the front table 1 from its starting position of Fig. 4. The gauge is shown in the latter position in Fig. 6. The distance moved by the gauge 10 is then measured by reference to lines 21—24. If line 24 (Fig. 3) is spaced from line 21 a distance equal to the length of chord C (Fig. 4) which subtends the arc of cutting circle A above the plane of rear table 2 it will be apparent that line 24 will coincide with line 26 (Fig. 6) after the knife has moved the gauge 10 as above described.

By making the spacing between lines 21, 24 equal to the chord C of a properly set knife it will be apparent that any deviation between the position of line 24 and line 26 (Fig. 7) will be directly proportional to the amount which the knife must be moved to place it in its proper position. However, it should be understood that the distances measured on table 2 are large in proportion to the radial adjustment of the knives, thus making for greater accuracy.

If, after the above operation, line 24 on scale 19 coincides with 26 (Fig. 7) the knife 4 is in a correctly set position. If line 24 does not coincide with line 26 the knife should be moved inwardly or outwardly of the cutterhead depending upon whether the distance travelled by gauge 10 is too long or too short with reference to line 26. The above operation is therefore repeated until gauge 10 moves the distance between lines 21 and 24.

The above described operation is preferably carried out with the gauge 10 positioned on one end of the knife 4 and is then repeated at the opposite end of the knife. In this manner the knife edge is set exactly parallel to the axis of the cutterhead.

Each of the knives 4 may be set in the manner above described, the operation being identical in each case.

As pointed out above, it is important that the knife edge 28 does not slip with respect to the gauge 10 during the setting operation. For this reason the weight of the gauge 10 should be sufficient to insure a good engagement between the knife edge and the bottom wall 11. The tendency of the knife to slip with respect to the gauge 10 is greatest just before the knife is disengaged from the bottom wall and it is at this point that the resistance of the gauge to being dragged over rear table 2 is maximum. For this reason, it is preferable to reduce the resistance of gauge 10 by providing a roller 30 at the trailing end of the same (Figs. 1, 2).

Roller 30 is relatively small in diameter and the juncture between rear wall 14 and bottom

wall 11 is provided with a relatively narrow slot 31 to receive the roller so that the same is substantially tangent with the rear wall 14 and bottom wall 11 (Fig. 2). A pin 32 may be driven through a suitable aperture in body 10 to provide a bearing for the roller 30. In addition, the juncture between rear wall 14 and bottom wall 11 should be rounded off at 33 to insure engagement of roller 30 with table 2.

By the above structure slippage between the knives and the body is completely obviated and the distance moved by the gauge is exactly equal in all cases to the length of chord C (Fig. 4). The gauge 10 is stable at all times being adequately supported at its forward end by the knife edge.

From Fig. 7 it will be apparent that the transparent scale 19 may be viewed by an operator from above thus facilitating the setting process.

To adapt the gauge for use with jointers having different sizes of cutterheads lines 22, 23 may be scribed in addition to line 24 above described. Thus line 24 will be employed for the largest size of cutter head and lines 22, 23 for smaller sizes.

From the foregoing it will be apparent that line 21 constitutes a fiducial line for measuring the length of chord C (Fig. 4) and lines 22, 23, 24 represent indicia for different sizes of cutting circles.

The spacing between fiducial line 21 and indicia 22, 23, 24 is predetermined from the cutting circle of a knife set with the heel 29 of the bevelled portion of the cutting edge adjoining the periphery of the cutterhead (Fig. 4). In this manner adequate support is provided for the knife and at the same time the chipper bar 6 is correctly spaced for ejecting the chips cut by the knives.

The above described method may be followed with the gauge placed on the front table but it is preferable to employ the rear table and rotate the cutterhead in the normal direction.

The above detailed description should not be taken as restrictive of the invention but merely as the preferred form thereof, it being obvious that various minor changes may be made without departing from the invention as defined by the following claims.

I claim:

1. A gauge for setting the knives in the cutterhead of a jointer comprising an elongated body having a straight longitudinally extending base adapted to lie flat on a table of said jointer with one end of said base projecting over the cutterhead, a fiducial point on said base spaced from said one end for registration of said point with a predetermined fixed point on said table, indicia on said base spaced from said fiducial point a distance equal to the chord length of the arc travelled by the edge of a correctly set knife between two points on the plane of said table when the latter is substantially coplanar with the upper surface of said cutterhead, said body being provided with a downwardly opening recess and a longitudinally extending transparent scale positioned across the open side of said recess coplanar with said base, said fiducial point and said indicia being scribed on said scale whereby the same are viewable from a point above said body through said recess.

2. A gauge for setting the knives in the cutterhead of a jointer comprising an elongated body having a straight longitudinally extending base adapted to lie flat on a table of said jointer with

one end of said base projecting over the cutterhead, a fiducial point on said base spaced from said one end for registration of said point with a predetermined fixed point on said table, indicia on said base spaced from said fiducial point a distance equal to the chord length of the arc travelled by the edge of a correctly set knife between two points on the plane of said table when the latter is substantially coplanar with the upper surface of said cutterhead, a roller at the other end of said body adapted to engage said table for supporting said body at said other end for movement over said table when said body is tilted upwardly at said one end.

3. The method of setting a knife of a jointer to a predetermined cutting circle comprising the steps of positioning a table of said jointer with its working surface substantially tangent with the upper surface of the cutterhead to which said knife is secured, disposing a scale on said table with one end projecting over said cutterhead and with said knife in a position below said scale, rotating said cutterhead slowly with said knife moving toward said scale whereby the cutting edge of said knife will engage said scale and move the same along said table until said edge is disengaged from said scale, measuring the distance moved by said scale on said table and comparing said distance with the predetermined distance said scale is moved by a knife set on said predetermined circle, moving said knife inwardly or outwardly of said cutterhead depending on whether said measured distance is under or over said predetermined distance and returning said knife and scale to said first mentioned positions and repeating said steps until said measured distance equals said predetermined distance.

4. A gauge for setting the knives in the cutterhead of a jointer comprising: an elongated rigid body having a straight longitudinally extending base adapted to lie flat on a table of a jointer for supporting said body in a stable position, a fiducial point on the surface of said base and spaced from one end thereof for registration of said point with a predetermined fixed point on said table, indicia on the surface of said base spaced from said fiducial point a distance equal to the chord length of the arc travelled by the edge of a correctly set knife between two points on the plane of said table when the latter is substantially coplanar with the upper surface of said cutterhead, the width of said base in a direction transversely of its length being relatively narrow in comparison with its length to engage a short section only of said knife, and the height of said body in a direction at right angles to said base being substantially greater than its width to provide an inertial weight adapted to engage said knife, the portion of said body adjacent said point and said indicia being transparent to permit viewing said point and indicia from a point elevated from said base when the latter is flat on such table.

5. A gauge for setting the knives in the cutterhead of a jointer comprising: an elongated rigid body having a straight longitudinally extending base adapted to lie flat on a table of a jointer for supporting said body in a stable position, a fiducial point on the surface of said base and spaced from one end thereof for registration of said point with a predetermined fixed point on said table, indicia on the surface of said base spaced from said fiducial point a distance equal to the chord length of the arc travelled by the edge of a correctly set knife between two points

on the plane of said table when the latter is substantially coplanar with the upper surface of said cutterhead, the width of said base in a direction transversely of its length being relatively narrow in comparison with its length to engage a short section only of said knife, and the height of said body in a direction at right angles to said base being substantially greater than its width to provide an inertial weight adapted to engage said knife, the portion of said body adjacent said point and said indicia being transparent to permit viewing said point and indicia from a point elevated from said base when the latter is flat on such table, said base being formed of relatively soft material adapted to be cut by the edge of said knife.

HOWARD S. BEALE.

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