

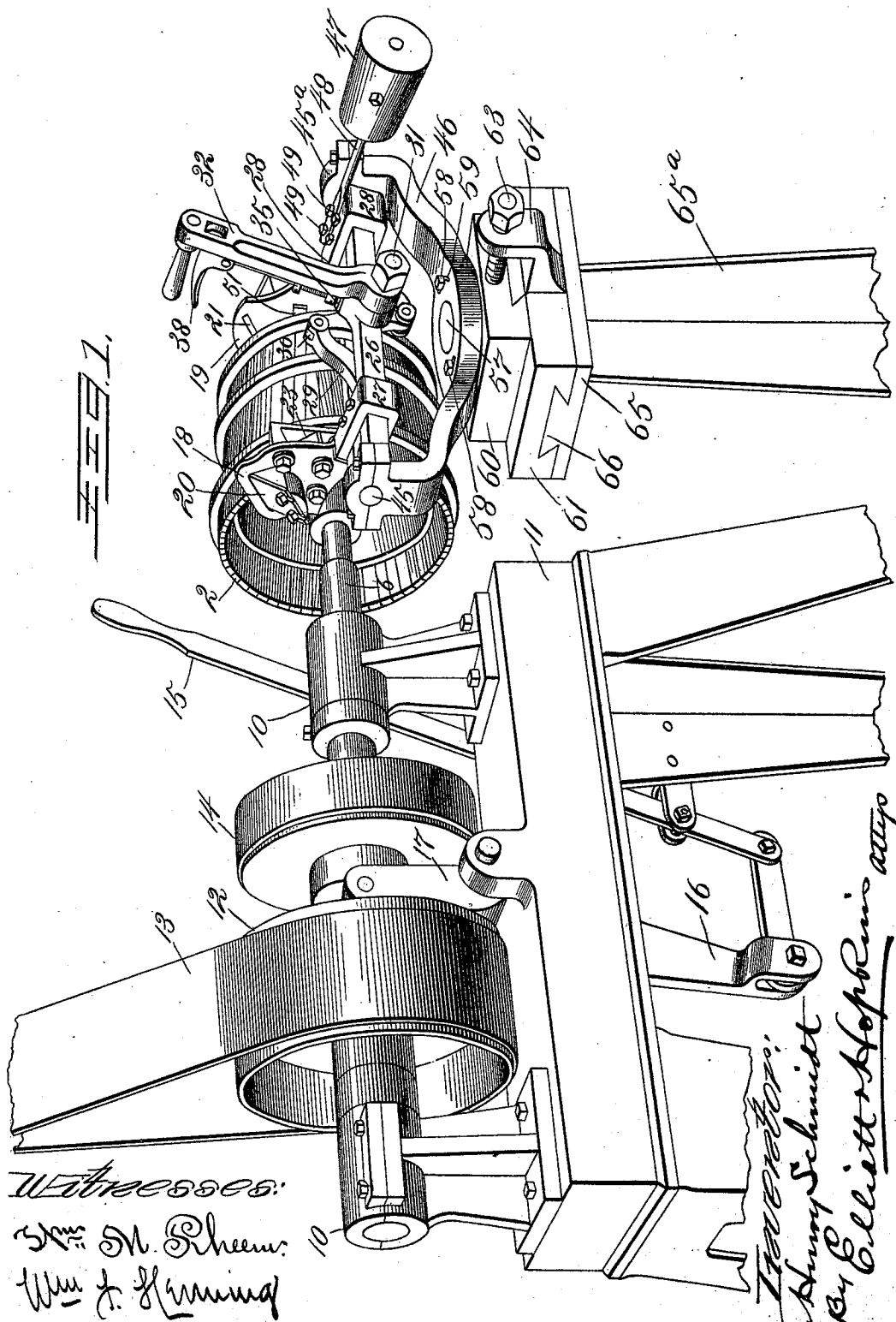
(No Model.)

4 Sheets—Sheet 1.

H. SCHMIDT.
COOPER'S LATHE.

No. 525,160.

Patented Aug. 28, 1894.



Witnesses:
Wm. M. Rhein
Wm. J. Hummel

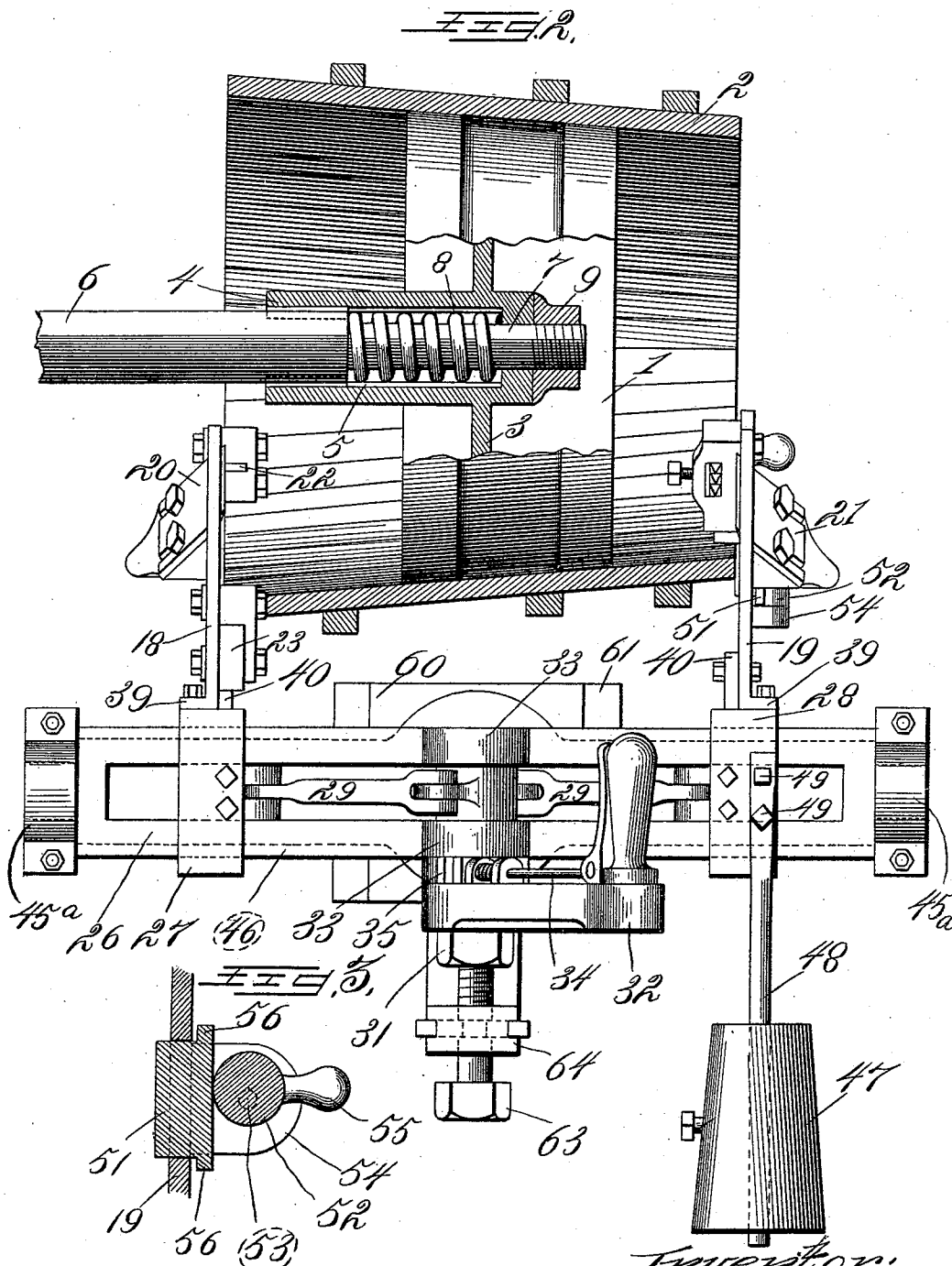
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Witnesses:
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Inventor:
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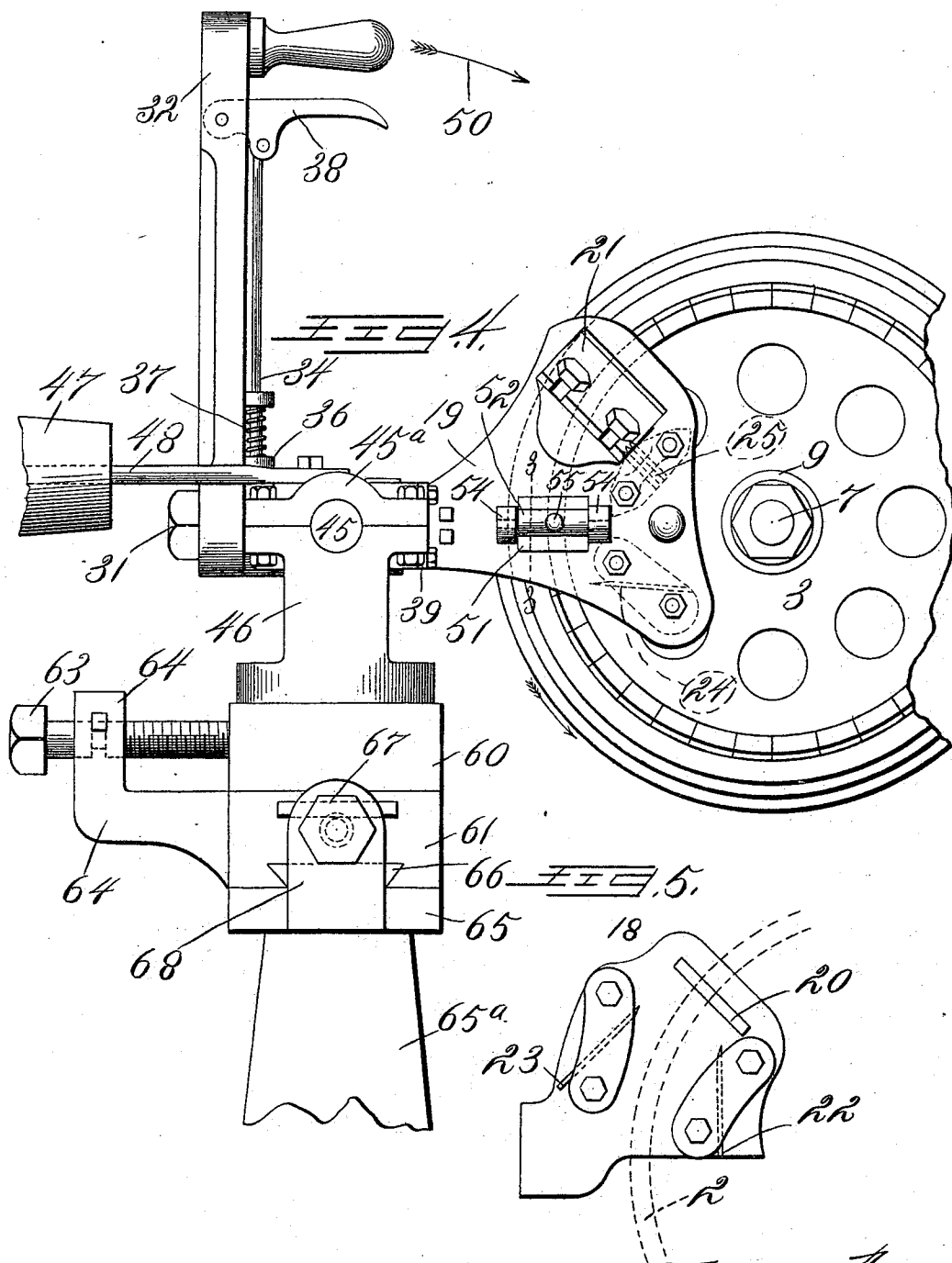
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H. SCHMIDT.
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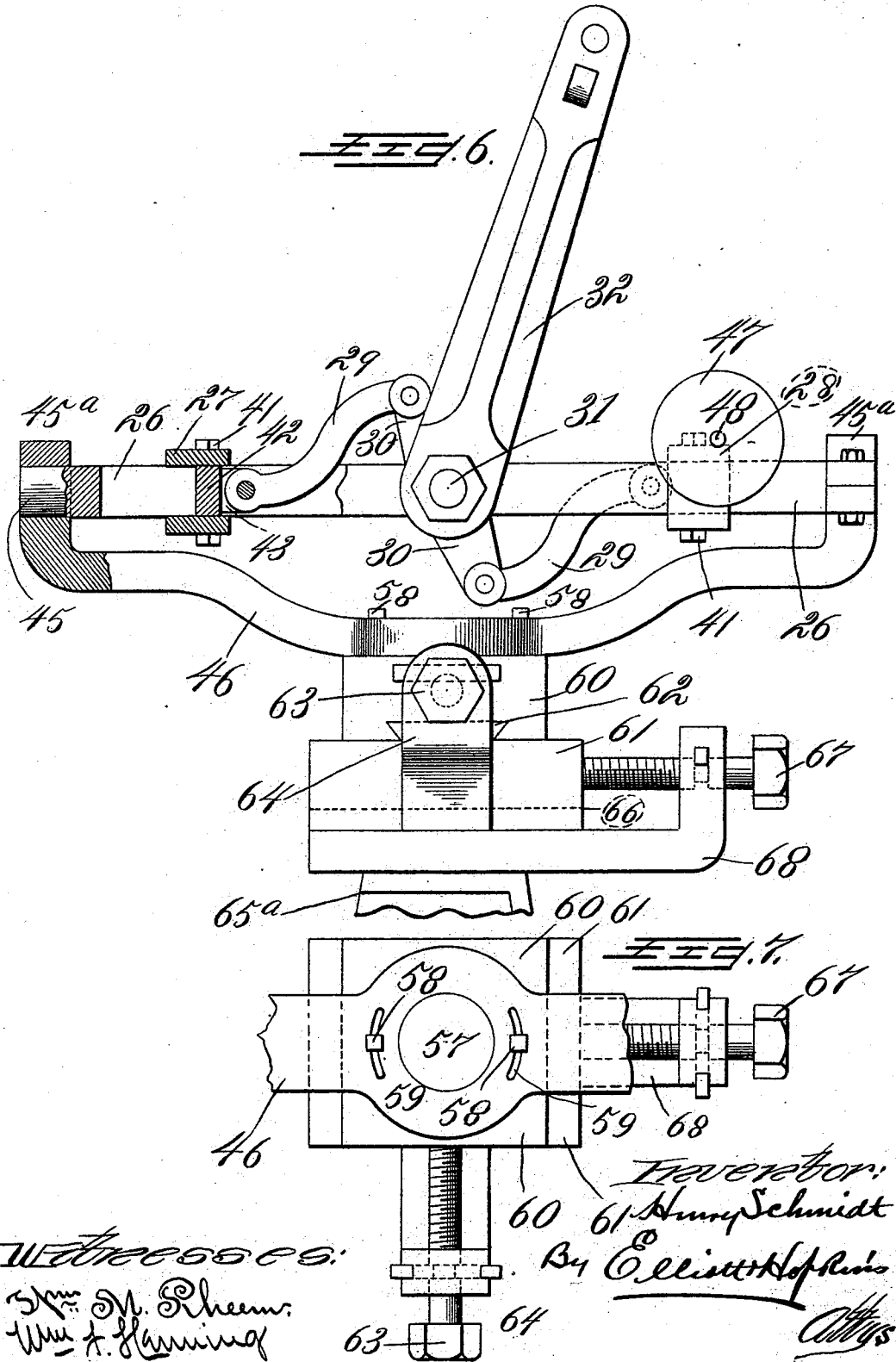
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UNITED STATES PATENT OFFICE.

HENRY SCHMIDT, OF ELGIN, ILLINOIS.

COOPER'S LATHE.

SPECIFICATION forming part of Letters Patent No. 525,160, dated August 28, 1894.

Application filed July 1, 1893. Serial No. 479,359. (No model.)

To all whom it may concern:

Be it known that I, HENRY SCHMIDT, a citizen of the United States, residing at Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Coopers' Lathes, of which the following is a full, clear, and exact specification.

My invention relates to improvements in lathes employed for finishing the ends and surfaces of tubs, such as butter tubs, kits and other similar vessels, and forming the croze groove therein for the reception of the edges of the head or bottom.

In devices of this nature it is customary to employ a rotary chuck or other such means for holding and revolving the tub to be finished, in conjunction with the dressing or smoothing and grooving tools arranged and adapted to be forced against the sides and ends of the tub, for chamfering or finishing the extremities of the staves, howeling or dressing their inner and outer sides and cutting the said croze groove or channel in the path of the howeling plane. Of these lathes, my invention relates more particularly to improvements in that class in which the knives or tools are so arranged as to be capable of acting on both ends of the tub or vessel at once.

One of the important objects of my invention is to provide for the employment of a cushioned chuck in a cooper's lathe, so that the chuck will be capable of yielding automatically with relation to the tools or cutters.

Another object of my invention is to make the tools, with relation to the chuck.

A further object is to provide improved means for regulating the bite or cut of the tools on the ends of the staves or the tub. And a still further object is to provide for locking the tools or knives, in any position in which they are set, with reference to the length of the staves.

With these ends in view my invention consists in certain features of novelty described and claimed herein and shown in the accompanying drawings.

In the said drawings, Figure 1 is a perspective view of a lathe constructed according to my invention, a tub being shown in position therein. Fig. 2 is an enlarged detail plan

view showing the tub and a portion of the chuck in longitudinal section. Fig. 3 is an enlarged detail sectional view taken on the line 3—3, Fig. 4. Fig. 4 is an end view of the mechanism shown in Fig. 2, looking from the right. Fig. 5 is a detail view of the inner face or side of one of the tool stocks, showing a portion of the tub in dotted lines. Fig. 6 is a side elevation of the tool carrying frame or yoke and operating mechanism, looking from the left in Fig. 4, and Fig. 7 is a plan view of a portion of the tool carrying frame or yoke and the adjustable pedestal upon which it is mounted.

Like signs of reference indicate like parts throughout the several views.

In carrying out my invention I mount the tool stocks upon a pedestal which is capable of adjustment longitudinally and transversely of the axis of the tub being operated upon, while the frame which carries the tool stocks is capable of swinging on upright and longitudinal axes and the tool stocks themselves are capable of moving in either direction lengthwise of the axis of the tub. The chuck which carries and revolves the tub between the tool stocks, is secured to its shaft so as to be compelled to rotate therewith, but is capable of moving longitudinally thereon so as to permit the free movement of the tub longitudinally of the latter's axis, independently of the tool stocks. One of the tool stocks is provided with an adjustable stop adapted to come against the end of the tub and force the latter away from the tools or knives carried by that stock, a spring or cushion being preferably provided for forcing the tub in the opposite direction.

Referring now more particularly to the drawings, 1 represents the chuck which may be conical in form as shown in Fig. 2, so as to conform to the interior of the tub or vessel which is forced over the chuck and held and revolved thereby. This chuck is provided with a web 3, projecting axially from which is a sleeve or box 4. The interior of this sleeve or box is provided with splines 5 which work in corresponding grooves as shown in dotted lines in the chuck-shaft 6, whose end is inserted in the box or sleeve 4, and is pro-

vided with a reduced stem or portion 7 upon which is sleeved a spiral spring 8. The portion 7 passes through an opening in the end of the box 4 and is held from being withdrawn by means of a nut 9 screwed on the end thereof. The spring 8 abuts at one end against the shoulder produced on the shaft 6 by the formation of the stem 7, and at its other end against the inner end of the box 4, so as to exert a normal tendency to force the chuck away from the shaft and hold the end of the box 4 normally against the nut 9. By this arrangement it will be seen that the chuck is firmly secured to its driving shaft 6 and is compelled to rotate therewith, while at the same time the spring constitutes a cushion, admitting of the chuck together with the tub being moved longitudinally of the shaft independently thereof.

The shaft 6 may be journaled in suitable boxes 10 mounted upon a bed or table 11, and being provided with a loose pulley 12 driven by a belt 13, from any suitable source of power. The motion of the pulley 12 may be communicated at will to the shaft 6 by means of a clutch 14 whose members are adapted to be thrown into engagement by means of the pivoted hand lever 15 as will be understood, the lower end of the lever 15 being linked with lever 16 whose upper end is connected to the fork or yoke 17 of the clutch in any convenient way.

18, 19 are the tool stocks in which are mounted respectively the leveling tools or planes 20, 21, whose inner ends project through suitable openings in the stocks and are adapted to engage with the ends of the staves for dressing or squaring the same. The tool stock 18 whose knives are arranged to engage with the upper end of the tub or vessel, is provided on either side with a smoothing tool 22, 23, respectively between which the edge of the tub revolves as indicated by dotted lines in Fig. 5, such tools 22, 23, being for the purpose of smoothing the inside of the tub and forming the outside rim howel. The other stock 19 however, is provided with a howel plane 24 as shown in dotted lines in Fig. 4, which engages with the inner sides of the staves at the bottom of the tub, and forms the smooth circle preparatory to cutting the croze channel or groove, which latter is produced by a crozing tool 25 also secured to the inner side of the stock 19, and being of any suitable construction.

The tool stocks 18 19 are adapted and arranged to approach and recede from one another so as to receive the tub endwise between them, suitable means being provided for drawing them together to engage the tub and forcing them apart when it is desired to admit a tub of greater length, or to release the tub which is being operated upon. An effective and desirable construction for accomplishing these movements consists of a way or track 26 composed of two parallel

bars as shown more clearly in Fig. 2, upon which are mounted two cross-heads 27, 28, to which the tool stocks 18, 19 are secured respectively. To each of the cross-heads 27, 28, is secured a link 29 whose inner end is pivoted to one end of a double crank arm 30, the latter being mounted upon and secured to a transverse shaft 31, whose outer end is keyed to an upright hand-lever 32, the shaft 31 being journaled in suitable boxes 33 formed on or carried by the way 26. Thus it will be seen that when the hand lever 32 is forced in one direction causing the shaft 31 to rock on its axis and oscillate the crank 30, the cross-heads 27, 28, and their attached tool stocks 18, 19, will be drawn toward each other; and when such lever is oscillated in the opposite direction they will be forced apart.

In order that the tool stocks may be locked in any position in which they are set by the described motion of the lever 32, I provide such lever with a locking dog 34 whose lower end engages with a segment rack 35 fixed to the way or track 26, the dog 34 being mounted in suitable keepers or guides 36 between which is interposed a spring 37 for holding the dog normally depressed, and its upper end being connected to a trigger 38 pivoted to the lever 32.

Each of the tool stocks 18, 19, may be provided at one end with a flange 39 which is bolted to its cross-head, while each of the cross-heads is provided with a flange 40 which is bolted to the tool stock, thus securing the tool stocks and cross-heads firmly together with capability of detachment when desired.

As a convenient way for constructing the cross-heads 27, 28, and holding them in place on the way 26, they are each composed of an upper and lower plate as shown more clearly in Fig 6, which are secured by bolts or rivets 41 to a block 42 fitting between the bars of the way 26 and having an ear 43 to which the link 29 is pivoted.

In order that the way 26 with the tool stocks carried thereby, may rock on its longitudinal axis, that is to say, on an axis extending lengthwise of the axis of the tub or the chuck so as to raise and lower the tool stocks, I provide the ends of such way 26 with journals or trunnions 45 which are mounted in suitable boxes 45^a carried on the upper ends of a yoke 46. Thus it will be seen that when it is desired to remove the tub 2 from the chuck, it is only necessary to first force the tool stocks slightly apart by oscillating the lever 32 to the left, and then oscillating such lever at right angles to the way 26, away from the tub. This movement will cause the way to turn in its journal bearings 45^a, and the tool stocks will consequently be elevated so as to clear the tub, the one lever 32 being utilized for producing both of the described movements of the tool stocks. In order that the tool stocks may remain in their elevated position without danger of accidentally falling

into engagement with the tub, I provide a counterbalance 47 which may be secured to the way 26 so as to rotate the same, by means of a rod or arm 48 upon which the weight 47 is adjustably secured, the arm itself being secured to one of the cross-heads by bolts or rivets 49. The lever 32 is also utilized for throwing the knives or tools into the different positions for operating upon the inner and outer sides of the tub.

The tools 22, 23, 24 and 25, it will be seen from Fig. 4, are so arranged that but one of them on each of the tool stocks can be in operation at a time. When it is desired to simply level or square the ends of the staves the tool stocks are set in the positions indicated in Figs. 4 and 5 so that the edges of the tub will run between the knives 22, 23, and will run clear of both the tools 24, 25. When it is desired to howel or smooth the inner sides of the staves preparatory to the formation of the croze groove, the lever 32 is forced in the direction of the arrow 50 Fig. 4, which will throw the knife 24 into engagement with the inner sides of the staves, the same movement carrying the knife 23 against the outside of the tub at its upper end and forming the outside rim-howel. When this operation has been completed the lever 32 may be forced in the opposite direction so as to bring the crozing tool 25 against the inner side of the tub and throw the knife 24 out of engagement, and at the same time throw the knife 22 on the stock 18 into engagement with the inner side of the tub at its upper end.

As indicated more clearly by Fig. 2, the tendency of the spring 8 is to force the chuck and the tub toward the tool stock 19. In order that this pressure of the tub against the leveling plane 21 may be controlled and the bite of such plane regulated, I provide the stock 19 with the adjustable stop before mentioned which may consist of a shoe or block 51 as more clearly shown in Fig. 3, working in a complementary opening in the stock 19 and adapted to come against the ends of the staves at the bottom of the tub as indicated in Fig. 4. This shoe or block is actuated and held up to its work by means of an eccentric 52 whose journals 53 are mounted in suitable ears 54 formed on or secured to the stock 19, the eccentric being provided with a knob or handle, 55, by means of which the eccentric may be rotated so as to bring its full side against the outer side of the block or shoe 51 for forcing the latter into engagement, or turning its other side next the block so as to permit the spring 8 to force the tub toward the planing tool 21, and thus cause the latter to take a deeper bite in the ends of the staves. This latter movement of course causes the upper ends of the staves to recede from the planing tool 20, and consequently it will be seen that by the employment of the described adjustable stop, arranged on one of the tool stocks only, the bite or engagement of both the planing tools 20, 21, may be regu-

lated and controlled. The shoe 51 is provided at its outer side with flanges 56 to limit its inward movement and prevent it from being knocked out of place when the tub is removed.

In order that the tools may swing to and from the tub in a horizontal or substantially horizontal plane, so as to accommodate themselves to tubs whose staves are set at various angles of inclination, I mount the yoke 46 upon an upright pivot 57, whereby one of the tool stocks may be forced toward the tub while the other is drawn away from it. Hence after finishing one tub whose staves are set at a certain angle of inclination, and it should then be desired to operate upon a tub whose staves are set at a different angle, it is only necessary to rotate the yoke 46 upon its pivot 57 until the knives or tools register with the edges of the tub. When the yoke has been properly adjusted it may be locked in place by means of set screws or bolts 58 passing through curved slots 59 formed in the hub of the yoke and engaging in the upper portion 60 of the pedestal, on which the pivot 57 is formed. These bolts or set screws 59 also serve to prevent the yoke 46 from jumping off its pivot.

In order that the yoke 46 may be adjusted bodily transversely of the tub so as to cause both knives to move closer to the axis of the tub at once, the upper portion 60 of the pedestal is provided with a slidable connection with the lower portion 61 of the pedestal. This connection may consist of a dove tail and groove formed on the parts respectively, and the adjustment of the part 60 may be effected by means of an adjusting screw secured rotatably against longitudinal movement in a bracket 64 formed on the part 61, and having its inner end engaging in a threaded socket in the portion 60 as will be understood.

In order that the whole frame carrying the tool stocks may be adjusted bodily longitudinally of the axis of the tub so as to enable me to fit the knives or tools to the ends of the tub in the event the tub when slipped over the chuck should come to a different position with reference to the axis of the chuck, from that which the previous tub occupied, I provide the portion 61 of the pedestal with a slidable connection with the stationary portion 65 of the pedestal, which portion 65 is mounted upon a standard 65^a. This said connection may likewise consist of a dove tail and groove 62, and the adjustment of the portion 61 with the parts carried thereon may be effected by means of an adjusting screw 67 arranged and operating like the screw 63, and being rotatably secured in a bracket 68 formed on the part 65.

By the described means it will be seen that I make the tools universally adjustable with reference to and independently of the chuck, and thus adapt the device for operating upon tubs of all shapes and sizes; it simply being necessary to change the chuck for a larger or

smaller one when the dimensions of the tub to be operated upon vary beyond certain sizes, it being understood that a single chuck of a given size is adapted for holding and revolving various sizes of tubs.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a cooper's lathe, the combination of the tool stocks having tools, and a chuck, the said chuck and tool stocks being movable bodily with relation to each other on a line lengthwise of the axis of the chuck, a cushion for causing the tools in one stock to engage, and means for causing such tools to disengage and the tools in the other stock to engage, substantially as set forth.

2. In a cooper's lathe, the combination of the tool stocks, a chuck mounted to move in an axial line between said stocks, a cushion for forcing said chuck toward one of said stocks, and means for regulating such movement of the chuck and forcing it in the opposite direction, substantially as set forth.

3. In a cooper's lathe, the combination with tool stocks having cutters therein, of means for holding and revolving the tub or vessel, arranged intermediate of said cutters and movable with reference to said cutters lengthwise of the axis of the tub, and a stop for forcing the tub lengthwise of its axis away from one cutter and toward the other, substantially as set forth.

4. In a cooper's lathe, the combination with a tool stock having tools, and means for holding them in engagement with the vessel or tub, of a chuck for revolving the vessel or tub, an adjustable stop adapted to force the tools and tub out of engagement, and a cushion for causing the tools to again engage when said stop is released, substantially as set forth.

5. In a cooper's lathe, the combination of a cushioned chuck, tool stocks adapted to be arranged at either end thereof, and an adjustable stop carried by one of said tool stocks and adapted to engage with the end of the tub or vessel, substantially as set forth.

6. In a cooper's lathe, the combination with a tool stock, of a chuck free to move longitudinally of its axis, a shoe carried by said tool stock and adapted to engage the end of the tub or vessel, and an eccentric for actuating said shoe and constituting therewith a stop for holding the tub away from the tools, substantially as set forth.

7. In a cooper's lathe, the combination of a chuck movable longitudinally of its axis, a tool stock having an opening therein, a shoe arranged in said opening for engaging with the end of the tub or vessel and having the flange 56, the ears 54 and eccentric 52 journaled in said ears and engaging with said shoe, substantially as set forth.

8. In a cooper's lathe, the combination with a chuck, of a track or way extending lengthwise of the axis of said chuck and being piv-

oted on an axis also extending lengthwise of the axis of the chuck, tool stocks mounted on opposite ends of said way and adapted to slide therealong, and means mounted on said way for reciprocating said tool stocks lengthwise of the axis of the chuck, substantially as set forth.

9. In a cooper's lathe, the combination with a chuck, and a yoke or frame independent of said chuck, and being pivoted on an axis extending transversely of the axis of the chuck, of a way pivoted in the said yoke on an axis extending lengthwise of the axis of said chuck, tool stocks arranged on opposite ends of said way and adapted to slide lengthwise of the axis of the chuck, and means for drawing said tool stocks toward each other, substantially as set forth.

10. In a cooper's lathe, the combination with means for revolving the tub, of a way or track pivoted on its longitudinal axis, a tool stock mounted to slide on said way lengthwise of its said axis, a lever pivoted to said way for rotating it upon its said axis, and being connected to and adapted to reciprocate the said stock lengthwise of the tub, substantially as set forth.

11. In a cooper's lathe, the combination with means for revolving the tub, of a way or track pivoted on its longitudinal axis, a tool stock mounted to slide on said way lengthwise of its said axis, a lever pivoted to said way on an axis extending transversely thereof, a rack carried by said way and a dog carried by the said lever for engaging with said rack, the said lever being connected to the said stock for reciprocating it along said way, substantially as set forth.

12. In a cooper's lathe, the combination with means for revolving the tub, of a frame or yoke pivoted on an axis extending transversely of the tub, a track or way pivoted in said yoke on an axis extending lengthwise or longitudinally of the tub, and tool stocks mounted on said way, substantially as set forth.

13. In a cooper's lathe, the combination with means for revolving the tub, of a frame or yoke pivoted on an axis extending transversely of the tub, a track or way pivoted in said yoke on an axis extending lengthwise or longitudinally of the tub, tool stocks mounted to slide on said way, and a lever secured to said way for rotating it on its said axis extending longitudinally of the tub, and having connection with said stocks; whereby said stocks may be adjusted longitudinally and transversely of the tub simultaneously, substantially as set forth.

14. In a cooper's lathe, the combination with means for revolving the tub, of a way or track pivoted on its longitudinal axis, cross-heads arranged on said way or track, tool stocks carried by said cross-heads, a lever pivoted on said way or track connected to said cross-heads, and adapted to reciprocate the same in opposite directions on said way or track, and

means for locking said cross heads, substantially as set forth.

15. In a cooper's lathe, the combination with
5 a way or track upon which said tool stock is
carried, pivoted on a longitudinal axis, a yoke
upon which said way is mounted, pivoted on

a vertical axis, and a counter-balance for said
tool stock, substantially as set forth.

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Witnesses:

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