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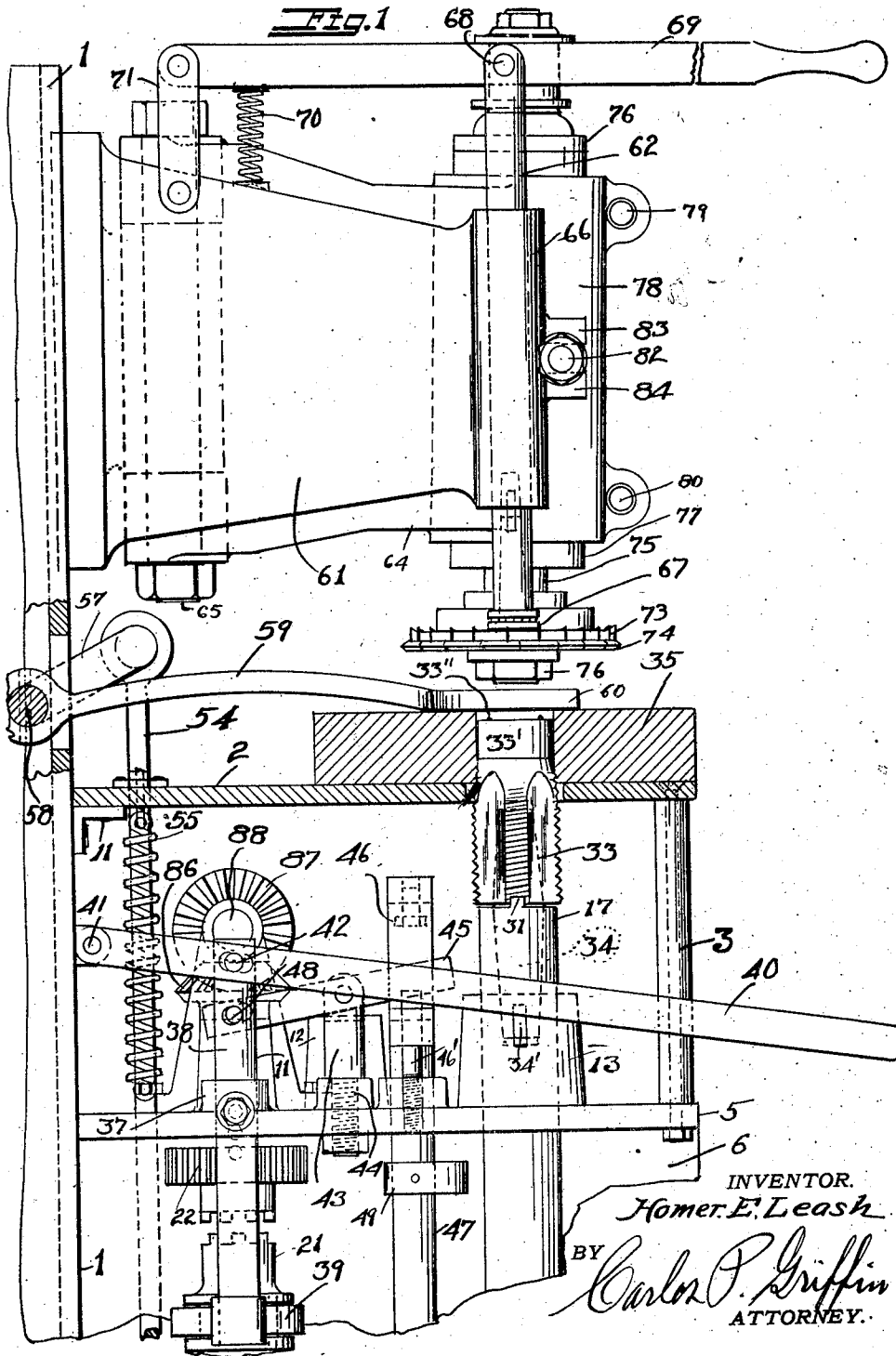
H. E. LEASH

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DEFECTIVE LUMBER IMPROVING MACHINE

Filed Jan. 29, 1925

3 Sheets-Sheet 1



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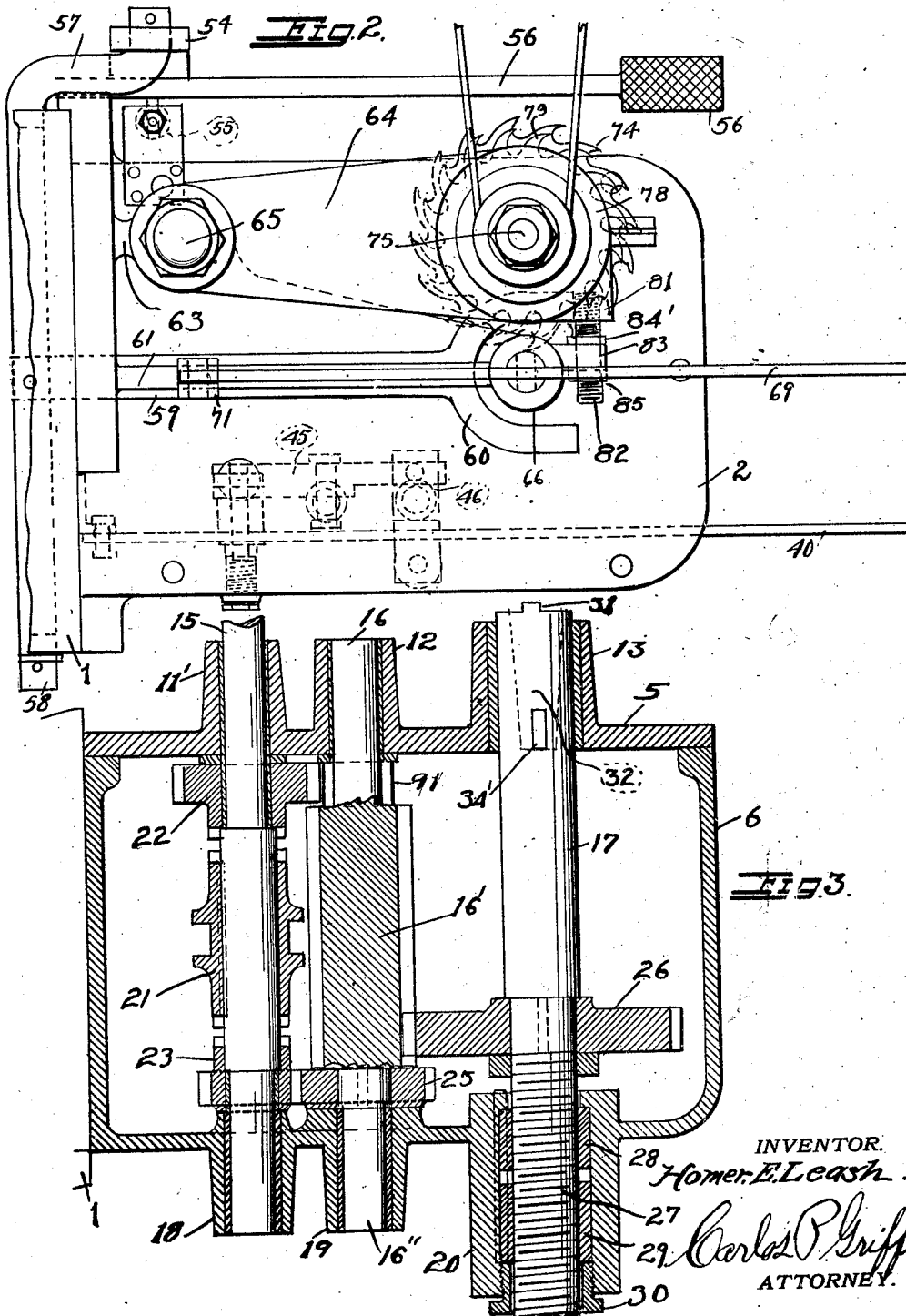
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DEFECTIVE LUMBER IMPROVING MACHINE

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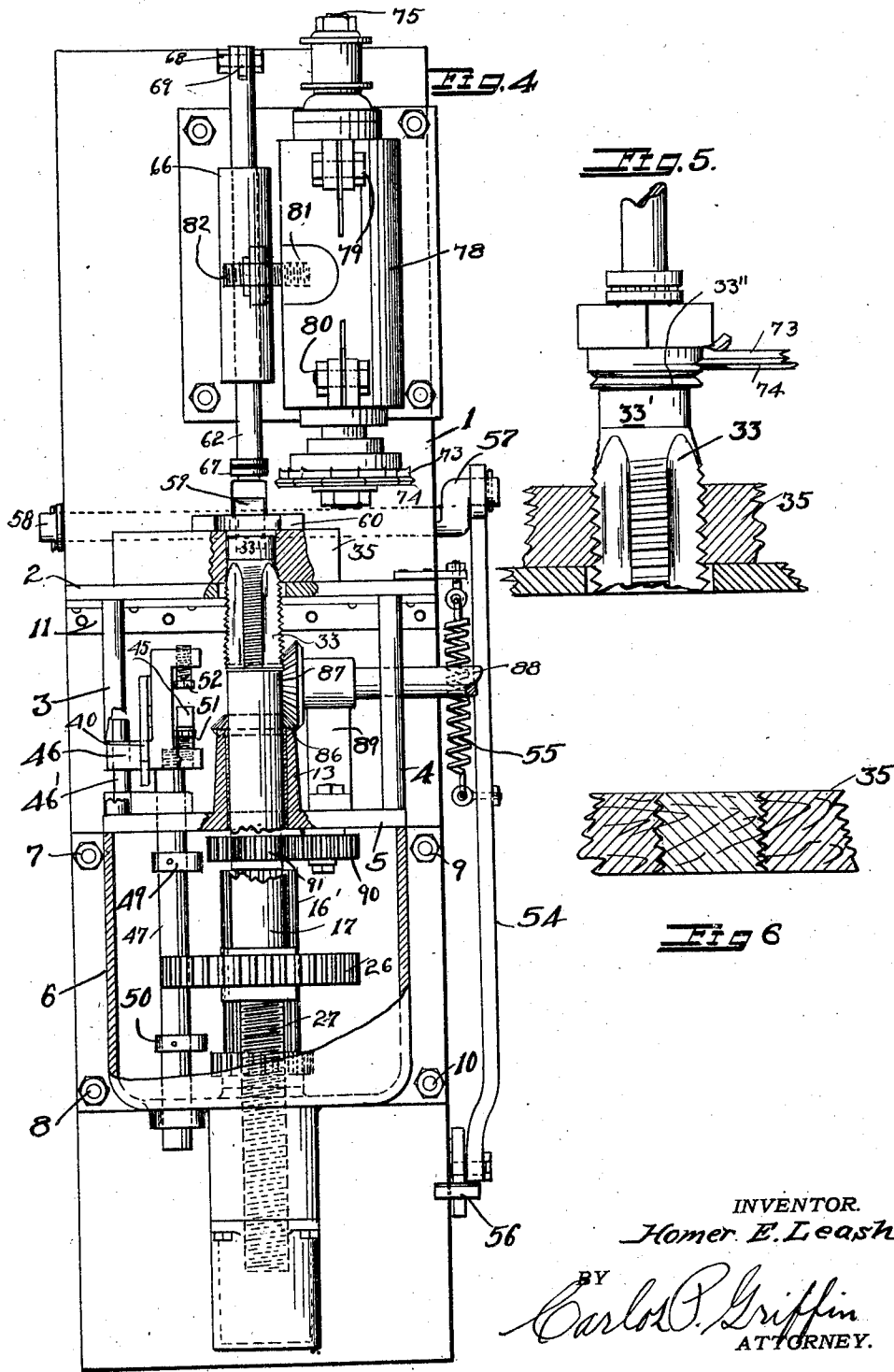
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DEFECTIVE LUMBER IMPROVING MACHINE

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3 Sheets-Sheet 3



Patented Aug. 3, 1926.

1,594,739

UNITED STATES PATENT OFFICE.

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DEFECTIVE-LUMBER-IMPROVING MACHINE.

Application filed January 29, 1925. Serial No. 5,568.

This invention relates to a machine for the purpose of inserting threaded blocks in lumber to improve the lumber and fill the lumber with a plug of sound wood in the place of a blemish which has been removed from the piece of lumber by boring.

It will be understood by those skilled in the art that lumber which has knot holes or other blemishes therein is unsuited for many uses and must either be thrown away or cut up into small sizes, but with the present invention those pieces of lumber which are often thrown away can be reclaimed for many uses by having a threaded plug inserted in the bore where the blemish has been removed, and this machine is intended to apply such plugs to the bores in two operations of the machine.

Another object of this machine is to provide means whereby the blocks for insertion in the holes where the blemishes have been bored out of the lumber may be trimmed and threaded as they are inserted in the hole, a saw, with a disk thereto, being used for the purpose of cutting the blocks to size and threading them.

Other objects of the invention will appear as the description proceeds.

An embodiment of the invention is shown in the accompanying drawings in which the same reference numeral is applied to the same portion throughout, but I am aware that there may be modifications thereof.

Figure 1 is a side elevation of the machine with parts thereof shown in section for purpose of illustration.

Figure 2 is a plan view of the machine.

Figure 3 is a view of the operating gears and a part of the base in vertical section.

Figure 4 is a front elevation of the machine; a portion thereof being shown in section.

Figure 5 is an enlarged view of the threading bit and the wooden plug to be inserted in the hole in the piece of lumber as it falls, illustrating the forming of the threads in the wooden plug.

Figure 6 is a sectional view through a piece of lumber showing the plug inserted in the hole therein.

The numeral 1 represents a post or standard to which the parts of the machine are connected and it supports the table 2, which table is in turn supported by two struts 3 and 4 from the top 5 of an enclosed gear

box 6; the latter being secured to the standard 1 by means of bolts 7 to 10 inclusive. An angle plate 11 secured to the standard 1 aids in securing the table 2 in the proper place. The gear box top 5 has bearings 11', 12, 13 formed therein for the shafts 15, 16 and 17, while the bottom of the gear box has bearings 18, 19 and 20 for the lower end of the same shafts.

Slidably mounted upon the shaft 15 is a double faced, grooved clutch collar 21; said clutch collar being capable of being connected to the gear 22 or with the gear 23, as may be desired; both of which gears are loose on the shaft 15, while the double faced clutch collar 21 is revoluble therewith but slidable into engagement with either of said gears.

The shaft 16 is integral with a long gear 16' which has a short shaft 16'' at its lower end, and the latter shaft has a gear 25 in mesh with the gear 23. The long gear 16' is in mesh with a gear 26 on the lower part of the shaft 17 whereby the shaft 17 may be rotated from a lower position to an upper one and from the upper position to the lower one in succession. The lower end of the shaft 17 is threaded as indicated at 27 and extends through two threaded bushings 28, 29, in the bearing 20, and to take up the slack due to wear the lower bushing 29 may be pushed up snugly against the threads 27 by means of a threaded bushing 30 screwed into the bottom of the bearing 20. The upper end of the shaft 17 has lugs as indicated at 31 and it is provided with a frustoconical hole 32 to receive the tap 33; said tap having a shank 34 which extends into the frustoconical hole and which tap may be driven out by inserting a wedge in the hole 34' of the shaft 17 whenever necessary.

The threads 27 and the threads of the tap 33 are given as nearly as possible the same pitch so that as the shaft rises the tap will be carried into the wooden block 35 placed upon the table 2 and which block has had a hole bored therethrough to take out the blemish.

Slidable vertically in a boss 37 is a shaft 38, at the lower end of which there is a yoke 39 which passes into the slot formed in the double clutch collar 21. A handle 40 projects from the front of the machine and is journaled on the standard at 41. It is also connected with a pin 42 to the top

of the shaft 38; the handle 40 being slotted to allow the necessary lateral movement of the pin with respect to the handle.

Just in front of the shaft 38 is a threaded standard 43 which is screwed into a boss 44 of the gear casing top, and at its upper end it pivotally supports a short lever 45, which lever at its front end projects between two arms of a yoke 46 in the vertically movable shaft 47 and which is connected at its rear end with a pin 48 to the shaft 38; said lever having a suitable slot to allow a slight movement of the pin with respect to said lever lengthwise of the lever.

The shaft 47 to which the yoke 46 is connected is just in front of the standard 43 and is slidable through holes in the top and bottom of the gear box. It is provided with two arms 49, 50; the object of which is to stop the raising or the lowering of the threading tap. The yoke 46 is slidable upon an upwardly projecting post 46' and it has two adjusting set screws 51, 52, to give the desired adjustment. At the back of the gear box there is a vertically movable rod 54 which is held in a normally raised position by means of the spring 55. It has the foot pedal 56 connected thereto at its lower end and at its upper end it is connected to an arm 57 on a shaft 58; said shaft being journaled in the back plate 1 of the main machine. This shaft also carries an arm 59 which has a yoke 60 projecting on both sides of the opening through which the threaded tap passes. At the top of the main plate 1, forming the back of the machine, there is a fixed bracket 61 extending outwardly to allow the shaft 62 to slide therethrough axially in line with the shaft 17, and there is also a shorter fixed arm 63 upon which the pivoted saw arm 64 is mounted and which is secured thereto by the bolt 65. The shaft 62 is freely slidable through the bearing 66 at the end of the arm 61. The lower end of the shaft 62 is provided with a ball bearing 67 which bears upon the piece of wood to be inserted in the hole in the block 35, and at its upper end it is connected by means of a pin 68 with the lever 69; a spring 70 holding said lever normally in a raised condition so that the lower end of the spindle cannot touch the top of the tap. This lever is also connected to the link 71 which link is pivotally supported by the bracket 61. The saws 73, 74 are provided with teeth of such a nature that the saw 73 will cut a smooth cylinder from the piece of wood used to fill the hole in the block 35; the ends of its teeth being perfectly straight, while the saw 74 has the ends of its teeth V shaped (see Fig. 1) to provide the threads on the block. The two saws are suitably secured to a spindle 75 by means of a nut 76 and said spindle is carried by a slidable sleeve 77

which can be raised or lowered in the split shell 78 and secured in any given adjustment by the bolts 79, 80 which pass through ears projecting from said shell. The shell 78 has a boss projecting from one side thereof as indicated at 81 and a bolt 82 is screwed into said boss and projects between two lugs 83, 84 on the sleeve 66. Nuts 84', 85 are threaded on the bolt 82 and serve to precisely adjust the position of the saws with respect to the block of wood to be trimmed for insertion in the hole of the block 35. At its upper end the shaft 15 carries a bevel gear 86 which is in mesh with another bevel gear 87 on the transverse shaft 88; said shaft being journaled in a bearing 89 and receiving power from any suitable source. The operation of the apparatus is as follows:

The workman on this machine receives a series of pieces of lumber such as 35 which have had a hole bored through them to remove a knot or other blemish. He then places the piece of lumber on the table 2 under the arm 59, whereupon he depresses the foot pedal 56. This will secure the piece of lumber firmly in position and prevent it from either rotating or jumping up as it is operated upon. Thereupon the operator will raise the lever 40 with the result that the spindle 17 will be forced into the block 35 and this movement will continue until the large gear 26 strikes the arm 49, which will be lifted a small amount, and as it is lifted it will cause the disengagement of the clutch collar 21 with the gear 22, thereby stopping the rotation of the tap 33. The arrangement is such that the upper end of the tap 33 which is reduced in size as indicated at 33' will miss the edges of the saws, but the top of the tap will pass above the plane of the saws, thereupon the workman places a small block of any convenient shape upon the top of the tap and then bears down upon the lever 69 to hold the block firmly on the tap, which latter has small projections extending therefrom as indicated at 33'', to prevent the rotation of the block under the action of the saws with respect to the tap while maintaining pressure upon the lever 69; the workman will then depress the lever 40. This will at once cause the reverse rotation of the tap 33 and as it is carried downwardly the block will be first trimmed smooth by the saw 73 and then threaded by the saw 74 as illustrated in Fig. 5. While maintaining a continuous pressure upon the sleeve 69, the block will be carried downwardly through the piece of lumber 35, whereupon as soon as the threading block has been screwed into the piece of lumber far enough the entire operation will be stopped because in the lower position the gear 26 will contact with the lower arm 50 on the shaft 47 and thereby lower

said shaft and cause the disengagement of the clutch collar 21 with the gear 23, thereby again stopping the machine. When the block has been screwed into place it will be substantially flush with the piece of lumber 35 on both sides and in a very few minutes the threads of the block 35 will have sprung outwardly from each other enough to hold the block securely in place, even though the lumber is cut into small fragments. The precise position at which the tap will be stopped when it is rising or when it is falling is determined by the adjustment of the two screws 51, 52.

It will be seen that the gear 22 is in mesh with an idler 90 which in turn is in mesh with the small gear 91, just at the top of the long gear 16', thereby giving the gear 16 the proper direction of rotation to return the spindle to its lowermost position.

What I claim is as follows, but modifications may be made in carrying out the invention shown in the drawings and in the above particularly described form thereof, within the purview of the invention as defined by the annexed claims:

1. In a machine of the class described, a supporting table, a threaded spindle, means to force said threaded spindle into a hole in a piece of lumber, another spindle for holding a block of wood against the first spindle, and means to cut and thread said block to fit the hole in the piece of lumber through which the threaded spindle has been forced.

2. A machine of the class described, comprising a supporting table, a threaded spindle, means to force the threaded spindle through a hole in a piece of lumber on said table, means to hold a block on the table against the end of said threaded spindle and means to shape said block and thread it to fit the opening through which the spindle has been forced.

3. A machine of the class described, a supporting table, a removable threaded spindle, means to reversely rotate said spindle to force it through a hole in a piece of lumber to be treated and to withdraw it therefrom, a slidable shaft having means to secure a wooden block against the end of said spindle and means to trim and thread it to fit the opening in said piece of lumber through which the said spindle has been forced.

4. A machine of the class described, com-

prising a supporting table, a threaded revoluble spindle, a slidable shaft having means for holding a block of wood against said spindle when it has been forced through a hole in a piece of lumber, a saw for trimming and threading said wooden block to fit said hole, and means to automatically stop said spindle when it has passed through said hole or out of the same.

5. A machine of the class described, comprising a supporting table, a threaded spindle extending therethrough, means to rotate said spindle, a slidable shaft having means for clamping a block against the end of a threaded spindle, means to trim and thread said block to fit an opening in a piece of lumber through which said threaded spindle has been forced, clutches for engaging suitable gears to drive the spindle first in one direction and then in the other direction and means for disengaging said clutches at the end of the movement of the spindle either up or down.

6. A machine of the class described comprising a supporting table, means to clamp a block thereon, a threaded spindle extending therethrough, means to rotate and raise said spindle or thread a hole in said block, means to hold another block against the top of the spindle, means to trim and thread the latter block, and means to reverse the direction of rotation of the spindle to force the trimmed block into a hole in the first block.

7. A machine of the class described comprising a table, means to clamp a block thereon, a threaded revoluble spindle, means to force the spindle through a hole in said block, means to clamp another smaller block on the top of said spindle, means to force the second block and the spindle downwardly, and means to trim and thread the small block as it is forced downwardly with the spindle.

8. A machine of the class described comprising a revoluble spindle to thread a hole in a block of wood, means to secure another block on the top of said spindle, means to depress the spindle and securing means, and saws to trim the small block and thread it to fit the hole in the first block, and means to stop the spindle at top or bottom.

In testimony whereof I have hereunto set my hand this 22nd day of January A. D. 1925.

HOMER E. LEASH.