

June 3, 1930.

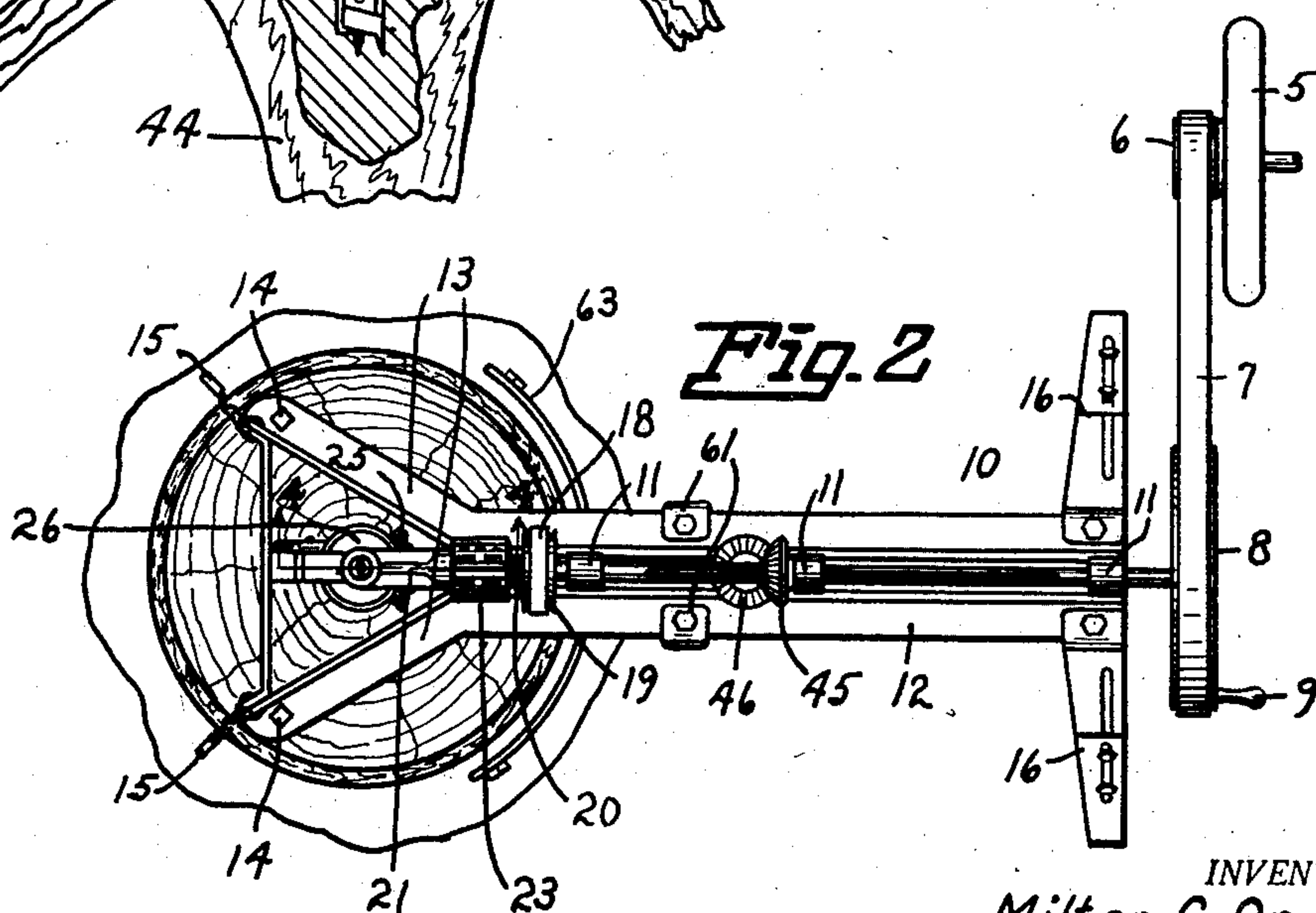
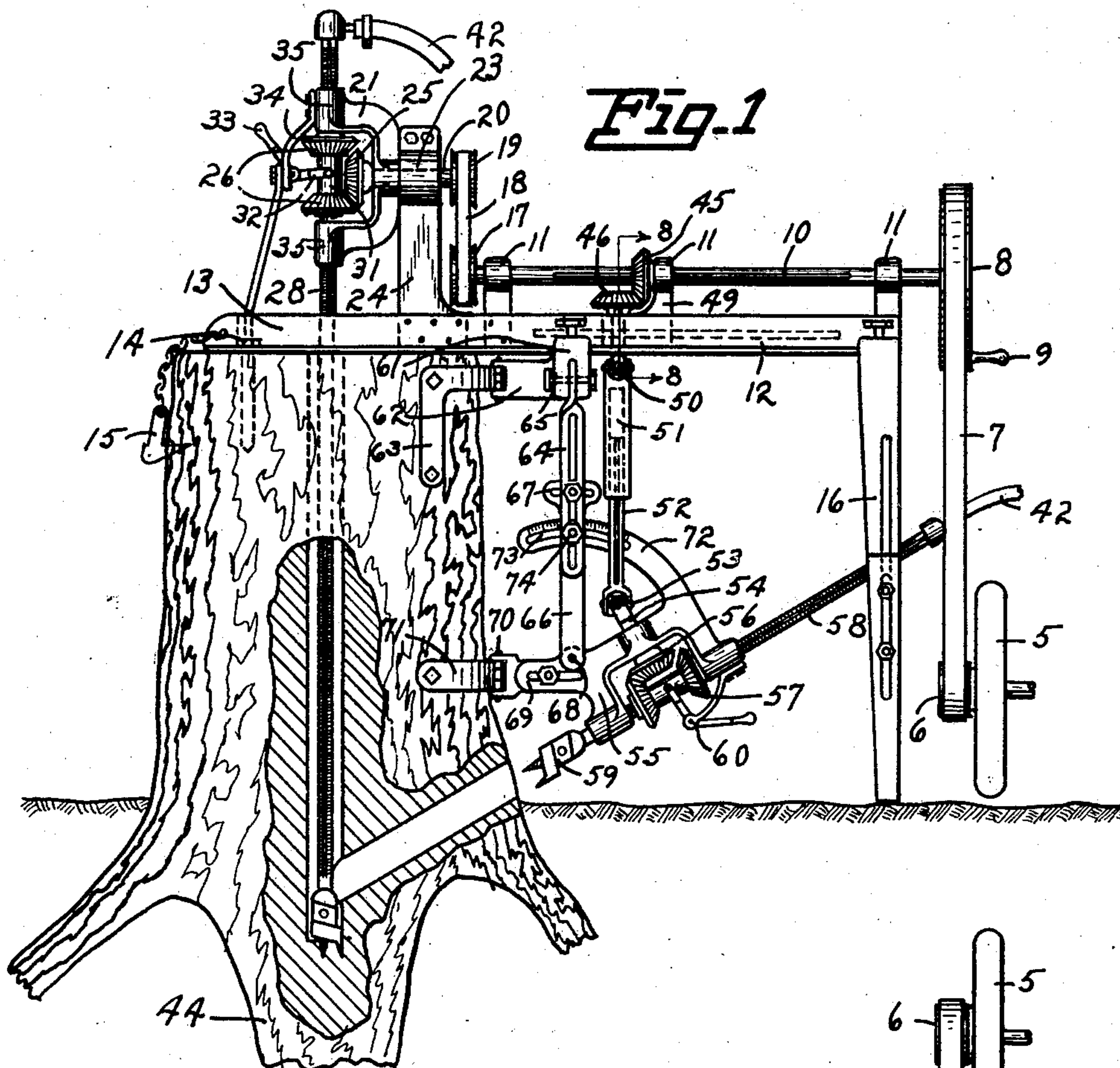
M. C. GRAY

1,761,663

BORING MACHINE

Filed July 2, 1929

2 Sheets-Sheet 1



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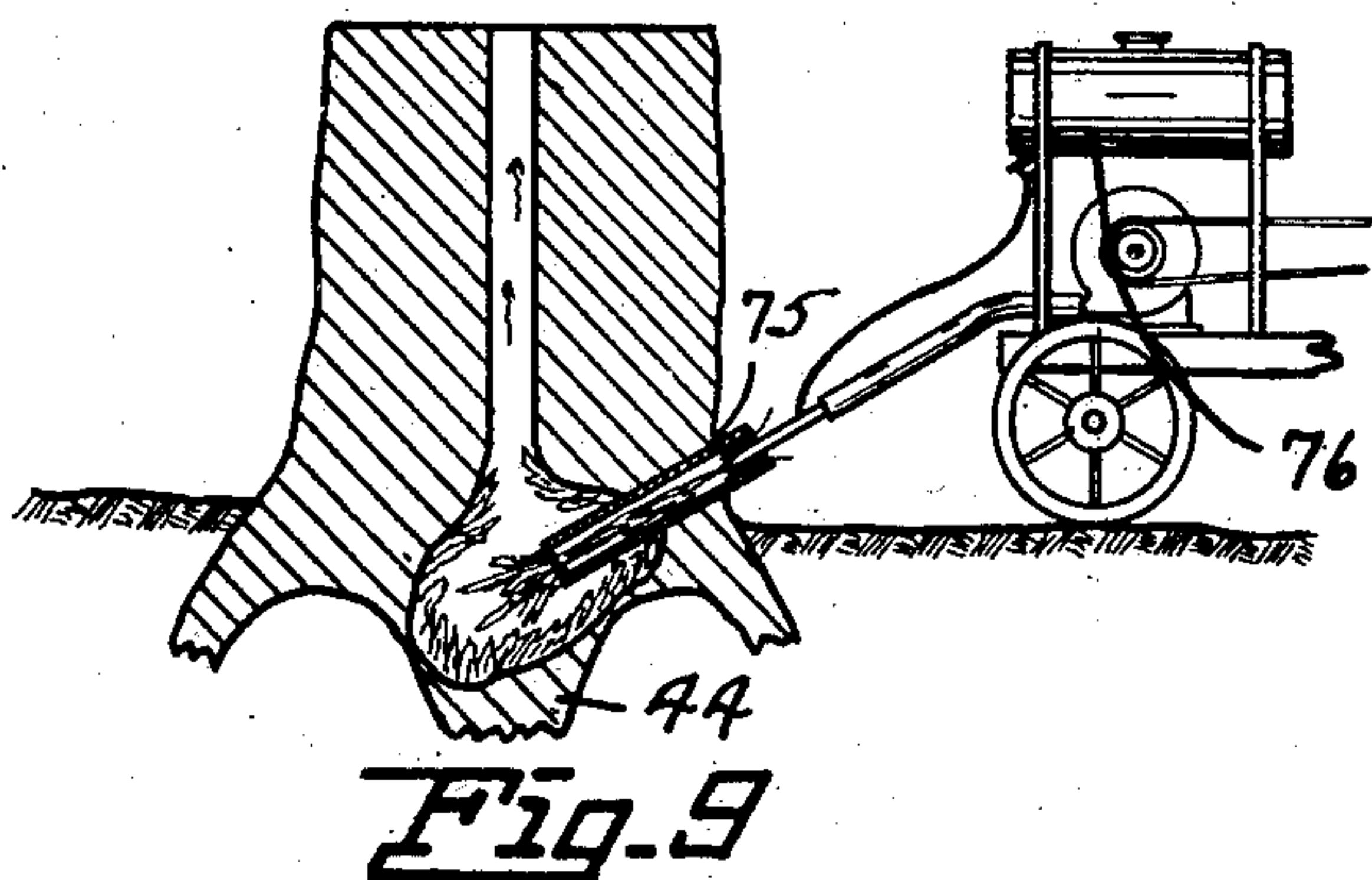
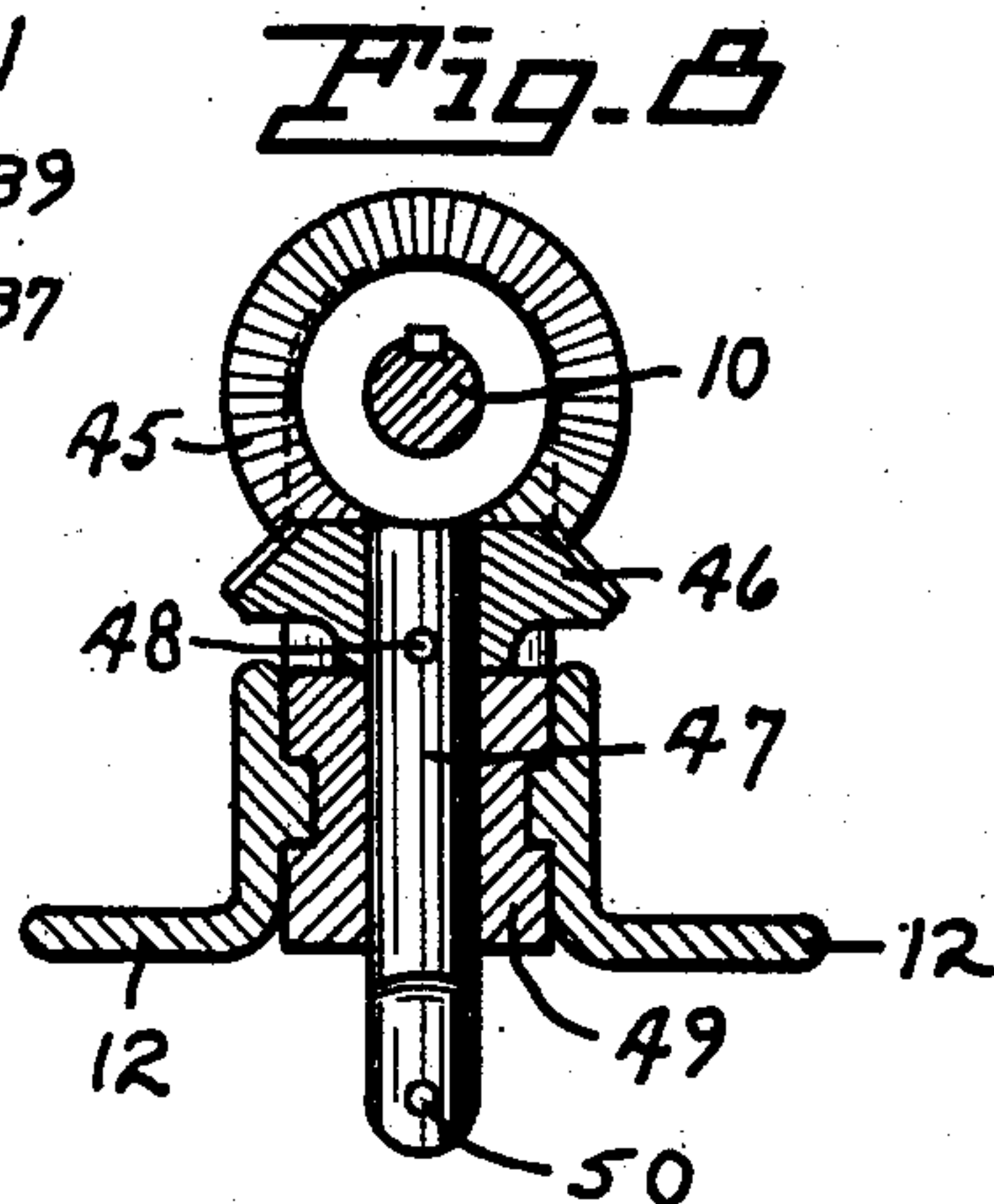
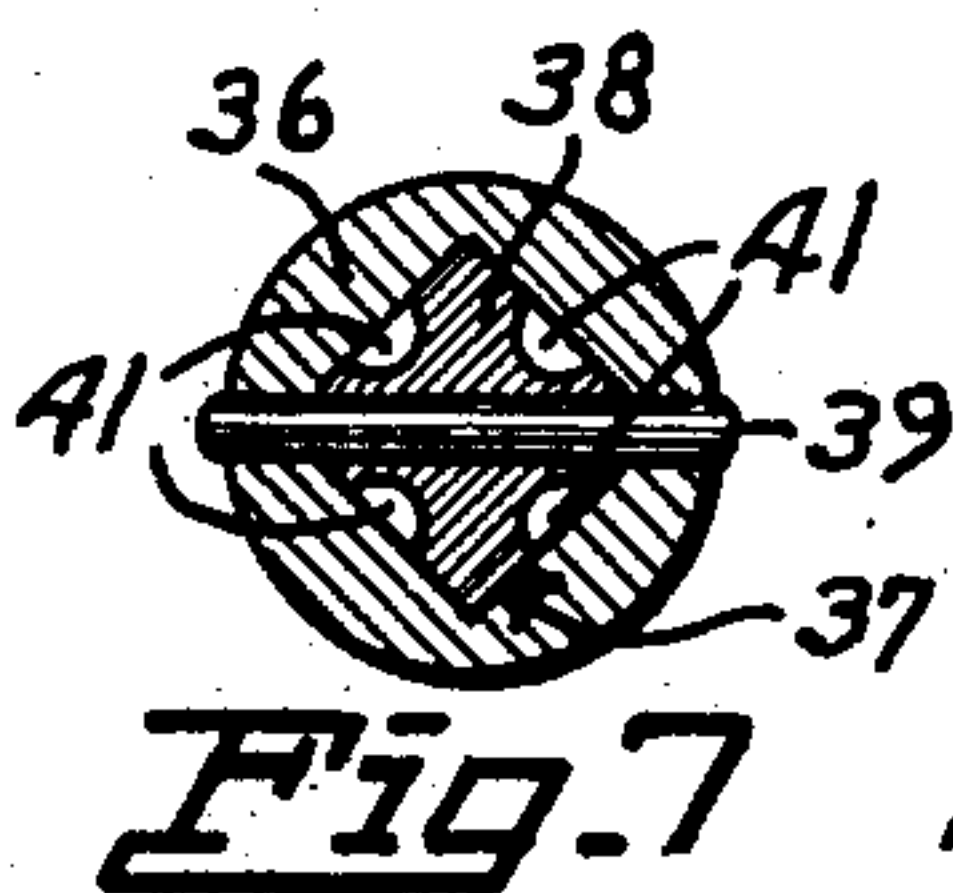
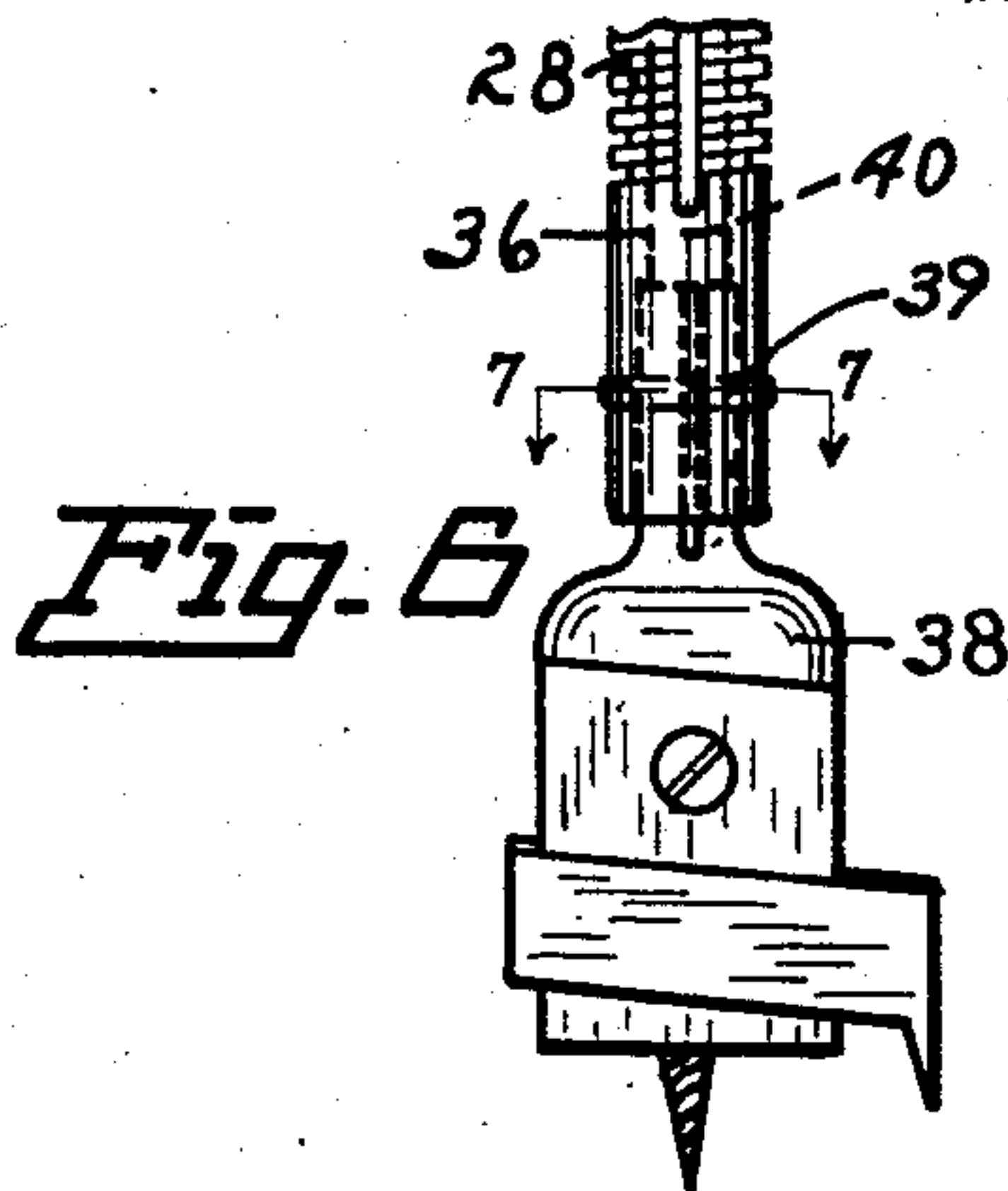
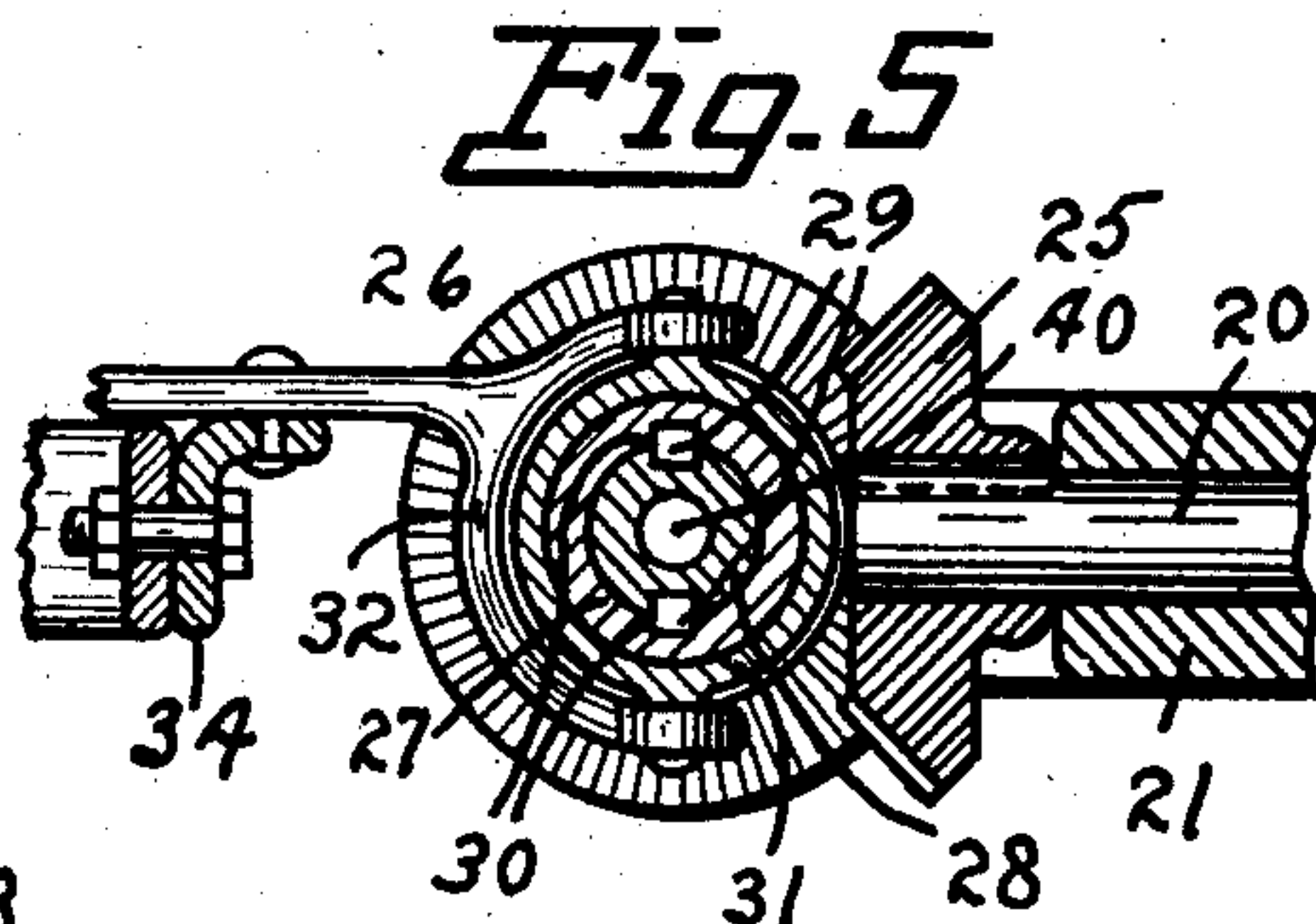
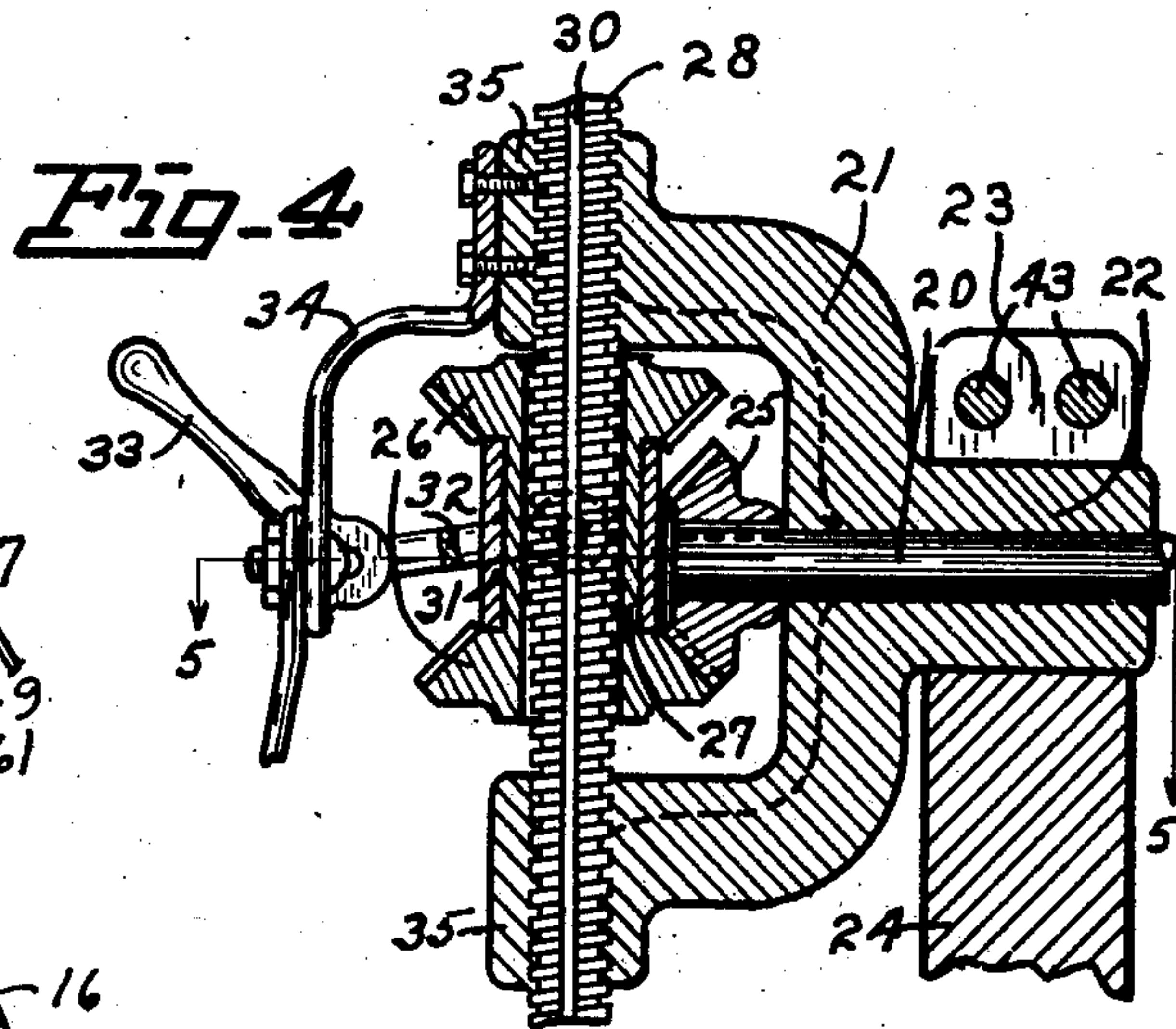
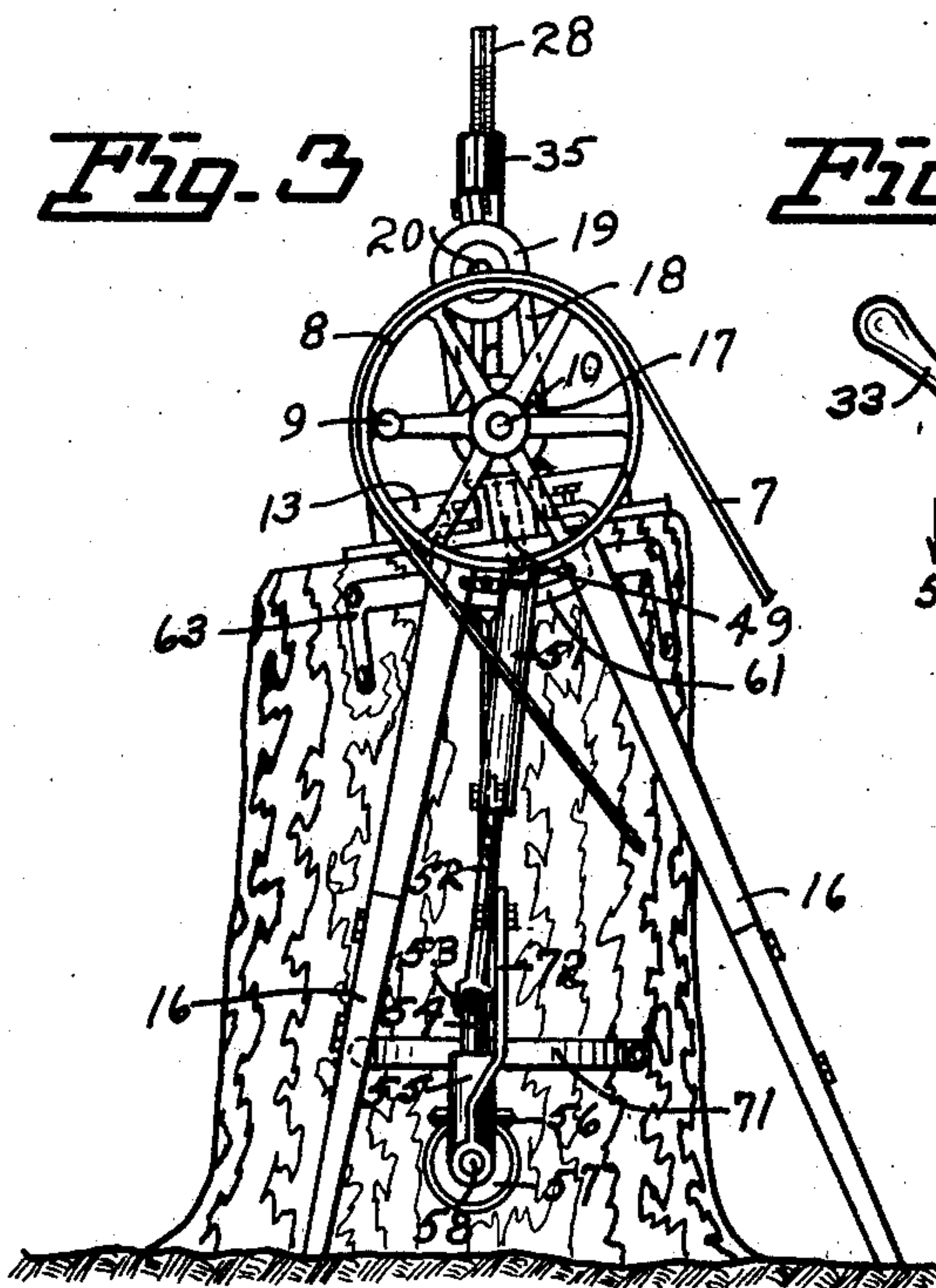
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

MILTON C. GRAY, OF SPOKANE, WASHINGTON

BORING MACHINE

Application filed July 2, 1929. Serial No. 375,509.

My invention relates to stump boring machines and certain objects of the invention are to provide a stump boring machine whereby a hole may be bored in the top and in the side of a stump at one and the same time. Further objects are to provide adjustable means whereby the direction of the bores may be altered as desired. Further objects are to provide means for detaching the means for making side bores from the vertical boring portion of the machine. Still further objects are to provide forced air means for driving out the shavings.

With the above and other objects in view, which will appear as the description proceeds, the invention consists of the novel construction, adaptation, combination and arrangement of parts hereinafter described and claimed.

These objects are accomplished by devices illustrated in the accompanying drawings; wherein:

Figure 1 is a view in side elevation of the machine mounted on a stump;

Fig. 2 is a top plan view of the same;

Fig. 3 is a view in end elevation of the same;

Fig. 4 is a view in enlarged vertical section of a bevel gear head and associated parts;

Fig. 5 is a view in horizontal section taken on a broken line 5, 5 of Fig. 4;

Fig. 6 is an enlarged detail view in elevation of a bit and its shaft;

Fig. 7 is a view in horizontal section taken on a broken line 7, 7 of Fig. 6;

Fig. 8 is a view in vertical section of the bevel gear shaft connections taken on a broken line 8, 8 of Fig. 1; and

Fig. 9 is a view in vertical section of a stump showing the method of burning same.

In the drawings the numeral 5 indicates the source of power which I have shown as the rear wheel of a motor vehicle although it will be understood that any other suitable means for supplying power may be used. A pulley 6 secured to said power source is supplied with a drive belt 7 leading to a larger pulley 8 which may have a handle 9 for manual operation, if desired.

The pulley 8 is secured to the main oper-

ating shaft 10 of the machine. Said shaft is journaled in bearings 11 that are mounted on an angle iron frame 12 which has its remote ends spread apart and bifurcated as at 13. Said bifurcated frame end portion is secured to the top of a stump as shown in Figs. 1, 2 and 3 by means of spikes 14 and hooks 15 which are connected to the frame by chains. The pulley end of the frame which extends out from the stump is supported by adjustable legs 16 whereby the device may be adjustably mounted on stumps of different heights and various degrees of slant.

The main shaft 10 has a pulley 17 fixed to its driven end from which a chain belt 18 extends to a pulley 19 mounted on a stub shaft 20. Said shaft is journaled in a U-bracket head 21 whose hub portion 22 is clamped in the upper split end portion 23 of an upstanding bracket 24 which is mounted on the frame 12. A bevel gear 25 is keyed to the driven end of the stub-shaft 20 and is adapted to mesh with either bevel gear end of a double or spool bevel gear 26 by means which will now be described.

The sleeve 27 of the spool gear 26 is slidably keyed to a worm shaft 28 by means of keys 29 fixed to said worm and keyways 30 cut in said sleeve wherein said keys are adapted to slidably move as clearly shown in Fig. 5 of the drawings. Said spool gear may thus be moved up and down on said worm and either of its bevel gear portions brought in mesh with the bevel gear 25 for a direct or reverse motion, or it may be brought to an intermediate or neutral position as desired. The means for shifting said spool gear comprises an outer sleeve 31 revolubly mounted on the sleeve 27 with a yoke 32 pivoted thereto and provided with a handle 33 that is supported by a bracket 34.

The hub ends 35 of the bracket head 21 are internally threaded to receive the worm shaft 28. Said shaft is relatively long and its lower end portion 36 is provided with a square socket 37 wherein the shanks of bits 38 are inserted and held by a pin 39 as shown in Figs. 6 and 7, so that the bits may be renewed or changed for others of different size when desired. Said worm shaft is hollow

as shown at 40 and the shanks of the bits are provided with grooves 41 so that an air pipe 42 connected to the upper end of said worm shaft may be used for blowing out the shavings through the enlarged bore in the stump as will be understood.

It will now be obvious that when the machine is set in motion a hole may be bored down from the top through the stump as illustrated in Fig. 1. In view of the fact that the tops of stumps are cut at different angles and the stumps themselves vary from the vertical, the direction of the bore or hole through the stump is adjustably controlled by the clamping arrangement whereby the hub 22 of the bracket head 21 is held between the split head 23 of the bracket 24. By loosening the holding bolts 43 the entire bracket head and associated parts may be pivotally moved and the worm shaft 28 may be so directed as to cause the bit 38 to bore in any desired direction. Said worm shaft is usually directed to bore downwardly into the tap root 44 of a stump shown in Fig. 1 as it is very important that this tap root be destroyed in order to remove the stump.

The vertical boring means having been specified, the means for horizontal or side bores, which is somewhat similar to the vertical boring means, will now be described. Said side boring means comprises first a bevel gear 45 fixed on the main shaft 10 and in mesh with another bevel gear 46 detachably fixed to the upper end of a vertically disposed splined shaft 47 by means of a slip pin 48 shown in Fig. 8. The upper end portion of said vertical shaft is journaled in a bearing 49 that is slidably mounted in the frame 12.

The lower end of the vertical shaft 47 is connected by a knuckle joint 50 to a sleeve 51. Another vertical shaft 52 has its upper end portion slidably disposed within said sleeve and its lower end connected by a knuckle joint 53 to a stub shaft 54. Said stub shaft is mounted in a bracket head 55 and is provided with a bevel gear 56 adapted to intermesh with a spool gear 57. Said gears together with a worm shaft 58, carrying a bit 59 and having a gear shift 60 with other details of construction are similar in all respects with the corresponding parts of the vertical bore mechanism and no description in detail of same is considered necessary.

The horizontal boring mechanism is supported by a head 61 that is slidably and detachably mounted on the angle iron frame 12. Said head has a slotted arm 62 and by means of a strap 63 same may be spiked to a stump as shown in Fig. 1. A slotted link support 64 is pivoted at 65 to said head and another slotted link arm 66 having a slotted cross head 67 is bolted to said link support. The lower end portion of said link arm is pivoted at 68 to the bracket head 55 and a

slotted projection 69 on said bracket is adjustably connected by a link 70 to a strap 71 which may be spiked to the stump as in Fig. 1. The bracket head 55 is provided with a relatively long curved arm 72 provided with a slot 73 that is concentric with the pivot support 68 and is connected by a bolt 74 to the slotted link support 64 and slotted link arm 66.

By means of the foregoing slotted, and pivotal connections it will be apparent, without a detail description, that the worm shaft 58 may be adjustably directed and that the entire horizontal boring mechanism may be raised and lowered in such manner as to bore the side of the stump at almost any desired point. It will also be obvious that this horizontal mechanism may be detached or disconnected whenever desired and the vertical boring mechanism used alone.

In making the side bore it is usually desirable to direct the hole at a slight downward slant and it is very desirable to direct same to the main tap root which must be eliminated before the stump can be removed or destroyed. As shown in Fig. 1 the horizontal bore intercepts the vertical bore at its bottom thus providing means for a draft for burning the stump. As shown in Fig. 9, a pipe 75 may be inserted into the horizontal bore and by means of a forced draft from an apparatus such as shown at 76 using oil or the like for fuel, the entire tap root may be burned off.

It will now be apparent that I have provided means for boring holes into stumps from the side as well as from the top and that said holes may be used for placing chemicals therein to cause dry rot, inserting explosives for forcibly removing the stump, or for the purpose of burning the stump as herein set forth. Having thus described my invention, it being understood that minor changes may be resorted to in its construction without departing from its scope and spirit, what I claim and desire to secure by Letters Patent of the United States is:—

1. A stump boring machine comprising a frame with a bifurcated end portion adapted to be mounted on the top of a stump, adjustable legs for said frame, a main operating shaft, a spool bevel gear, means for shifting said gear into direct reverse or neutral with relation to the main shaft, a worm shaft, a detachable bit for said worm shaft, means for adjusting the direction of the worm shaft, another worm shaft having a detachable bit directed to bore holes in the side of the stump, and said last named worm shaft adjustably geared to the main shaft.

2. A stump boring machine comprising a frame with a bifurcated end portion adapted to be mounted on the top of a stump, adjustable legs for said frame, a main operating shaft, a belt and pulley driven bevel gear, a

spool bevel gear, means for shifting said
spool gear into direct reverse or neutral rela-
tion with the bevel gear, a worm shaft im-
pelled by said spool gear, said worm shaft
5 having a conduit therethrough, means for
supplying air through said conduit, means
for changing the direction of the worm
shaft, and a detachable bit for the end of
said worm shaft.

10 In testimony whereof I affix my signature.
MILTON C. GRAY.

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