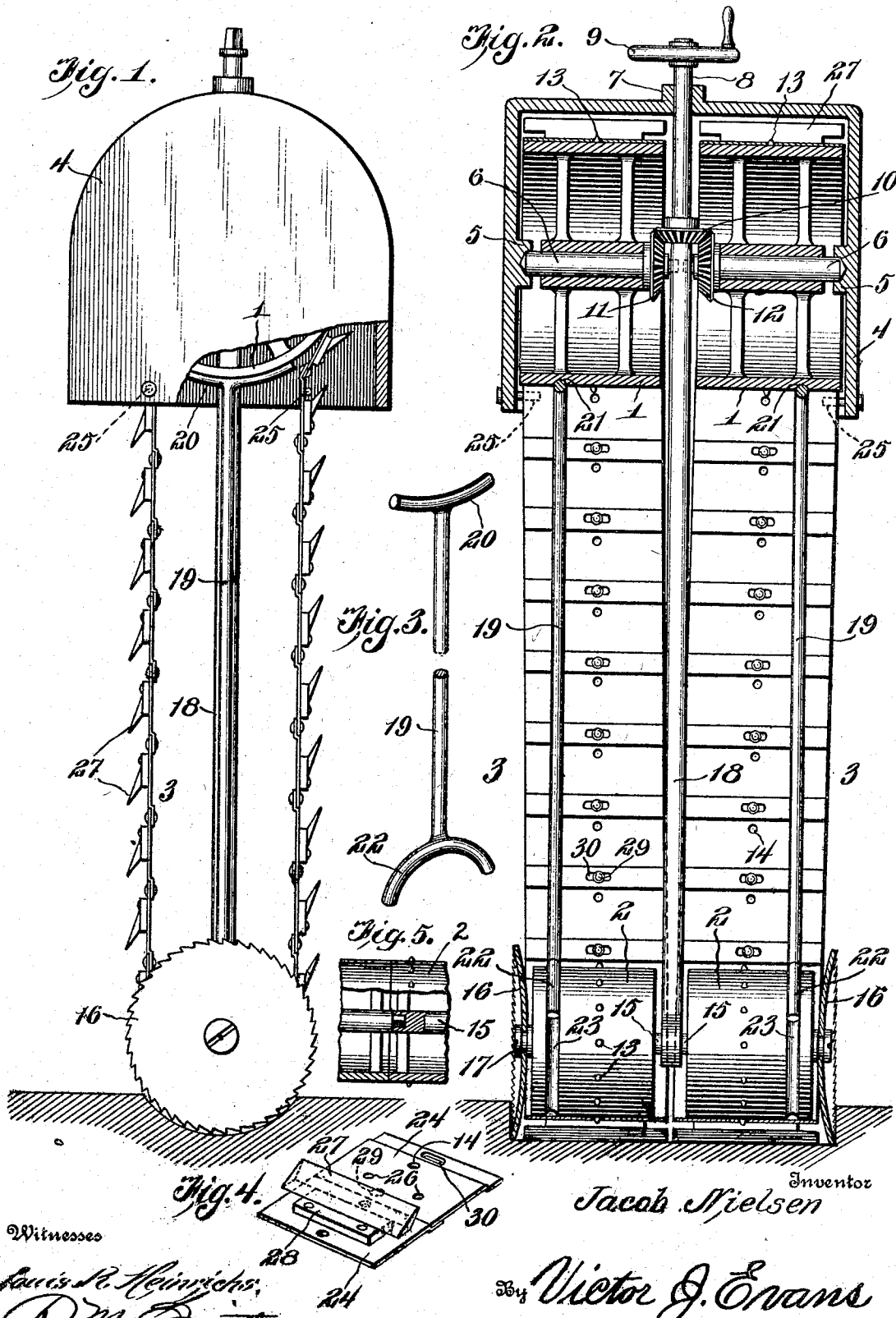


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SQUARE HOLE AUGER.
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939,438.

Patented Nov. 9, 1909.



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JACOB NIELSEN, OF BUTTE, MONTANA.

SQUARE-HOLE AUGER.

939,438.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JACOB NIELSEN, a citizen of the United States, residing at Butte, in the county of Silverbow and State of Montana, have invented new and useful Improvements in Square-Hole Augers, of which the following is a specification.

This invention relates to square hole augers, or in other words, augers or boring implements for forming square or rectangular holes or mortises, the object of the invention being to provide a device of the character described which is adapted to be made up of interchangeable parts whereby the device as a whole is capable of boring or forming mortises of different dimensions according to the requirements of the mechanic.

With the above general object in view, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed.

In the accompanying drawing:—Figure 1 is a side elevation of a boring device comprising the present invention. Fig. 2 is a vertical section through the same taken at right angles to Fig. 1. Fig. 3 is a detail perspective view of one of the braces. Fig. 4 is a detail perspective view of two of the overlapping members of the flexible cutter belt, showing one of the cutting bits. Fig. 5 is a detail elevation, partly in section, showing the manner of connecting the lower shaft sections.

The boring machine comprises essentially a pair of upper drums 1 and a pair of lower drums 2 in connection with which there are employed two endless flexible cutter belts 3, said belts traveling over and around said drums. By preference, the upper drums are mounted in a head casing 4 which is provided with bearings 5 for the reception of the two oppositely arranged and longitudinal sections 6 of the upper shaft upon which the upper drums are mounted fast.

The head casing 4 is also provided with an upper bearing 7 for the operating or driving shaft 8, the latter being provided above the casing with an operating element 9 such as a hand wheel of crank. It may be here noted that a belt wheel may be substituted for the hand wheel 9 to enable the boring machine to be driven by power. On its lower end the shaft 8 is provided with a bevel wheel 10 which meshes with other

bevel gears 11 and 12 on the upper shaft sections 6 whereby motion is simultaneously communicated to the two upper drums 1.

The upper drums and also the lower drums are provided on their peripheries with studs 13 which enter corresponding holes or sockets 14 in the flexible cutter belts 3. In this way, the upper drums impart motion to the cutter belts and the latter in turn impart motion to the lower drums 2. The lower drums are mounted on the opposite longitudinally alined sections 15 of the lower shaft and the drums 2 are fast on said shaft sections while secured to the outer ends of the shaft sections 15 are circular saws 16 which are dished on their outer sides as shown in Fig. 2 to enable the fasteners 17 which secure said saws to the mandrels or shaft sections 15 to lie within the plane of the outer periphery of the saws, so as not to interfere with the passage of said fasteners downward into the hole or mortise formed by the appliance, all of which is clearly indicated in Fig. 2.

Extending lengthwise and centrally of the appliance is a reach bar 18 which at its lower end is provided with bearings for the inner ends of the shaft sections 15. At or near its upper end it is provided with bearings for the inner ends of the upper shaft sections 6 and if desired the extreme upper end of the reach bar 18 may be provided with a bearing socket for the lower extremity of the operating or drive shaft 8, thus keeping all of the shafts in the proper alignment. In order to support the outer ends of the upper and lower arms 1 and 2 respectively, I provide oppositely arranged braces 19 provided at their upper ends with forks 20 which work in grooves 21 in the upper drums and provided at their lower ends with similar forks 22 which work in grooves 23 in the lower drums, as clearly indicated in Fig. 2.

Each of the belts is formed with a plurality of rabbeted overlapping sections 24, two of said sections being illustrated in detail in Fig. 4 wherein it will be observed that one edge of each section is rabbeted or offset to receive the adjoining edge of the next section, leaving the outer surfaces of the sections flush with each other so that they will travel easily over guide pins 25 carried by the head casing 4 just beneath the upper drums, the function of said pins 25 being to keep the offset runs of the belts

in parallel relation so that the belts will pass downward into the hole or mortise being formed by the boring implement. The sections 24 are further provided with holes 26 to receive fasteners by means of which cutting bits 27 are secured to the belt sections, one of said cutting bits being illustrated in detail in Fig. 4 wherein it is seen to comprise a base or flange 28 secured directly to one of the sections, said base or flange serving to hold the body of the bit sufficiently removed from the belt section to which it is attached to allow the section to engage the guide pins 25 and without the cutting bit striking against said pins.

Where the belt sections overlap each other, one of the overlapping edges is provided with a pin 29 while the adjacent overlapping edge is provided with a slot 30 in which the pin 29 is adapted to play as indicated in Fig. 2. This pin and slot connection is resorted to in order to enable the belt sections to move or slide relatively to one another and laterally with respect to the direction of travel of the belts. This is done in order to enable the belts to move apart at the upper portions of their runs for the purpose of straddling or dodging the drive shaft 8 as indicated at the upper end of Fig. 2 and also permit said belts to approach closely to each other at the lower portion of their runs as indicated at the bottom of Fig. 2.

In operation, the saws 16 form the end kerfs and the cutting bits operate immediately thereafter to chisel or shape out the material between the kerfs formed by the saws. This operation is continued until the hole is formed of the desired depth.

I claim:

1. In a boring device, the combination of upper and lower drums, flexible cutter belts traveling over said drums, means for driving the upper drums and transmitting motion to the belts, means for causing said belts

to drive the lower drums, circular saws mounted on the arbors of the lower drums, each of the belts being composed of a series of rabbeted overlapping sections movable relatively to one another and laterally with respect to their direction of travel.

2. A boring device of the class described embodying upper and lower drums, circular saws fast on the shafts of the lower drums, means for imparting motion to the upper drums, flexible cutter belts passing over the upper and lower drums and serving to transmit motion to the lower drums and to receive motion from the upper drums, a center reach rod connecting the shafts of the upper and lower drums, and braces for supporting the outer end portions of the drums, each of said belts embodying a series of connected overlapping sections movable relatively to one another laterally with respect to their direction of travel.

3. In a boring device of the class described, the combination with an upper set of drums, and a lower set of drums, the upper drums being spaced at a greater distance apart than the lower drums, the endless flexible cutter belts passing around the upper and lower drums, means for imparting motion to said belts and drums, dished circular saws actuated by the lower drums at opposite ends thereof, cutter bits carried by said belts, and means for causing the opposite runs of said belts to move in parallel planes, each of said belts being made up of a plurality of overlapping sections movable relatively to one another laterally with respect to their direction of travel, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB NIELSEN.

Witnesses:

ROBERT JENSEN,
GUSTAV KRING.