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F. F. GRAHAM

2,710,180

CHUCK AND BIT ASSEMBLY FOR CHANNELING STONE

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2 Sheets-Sheet 1

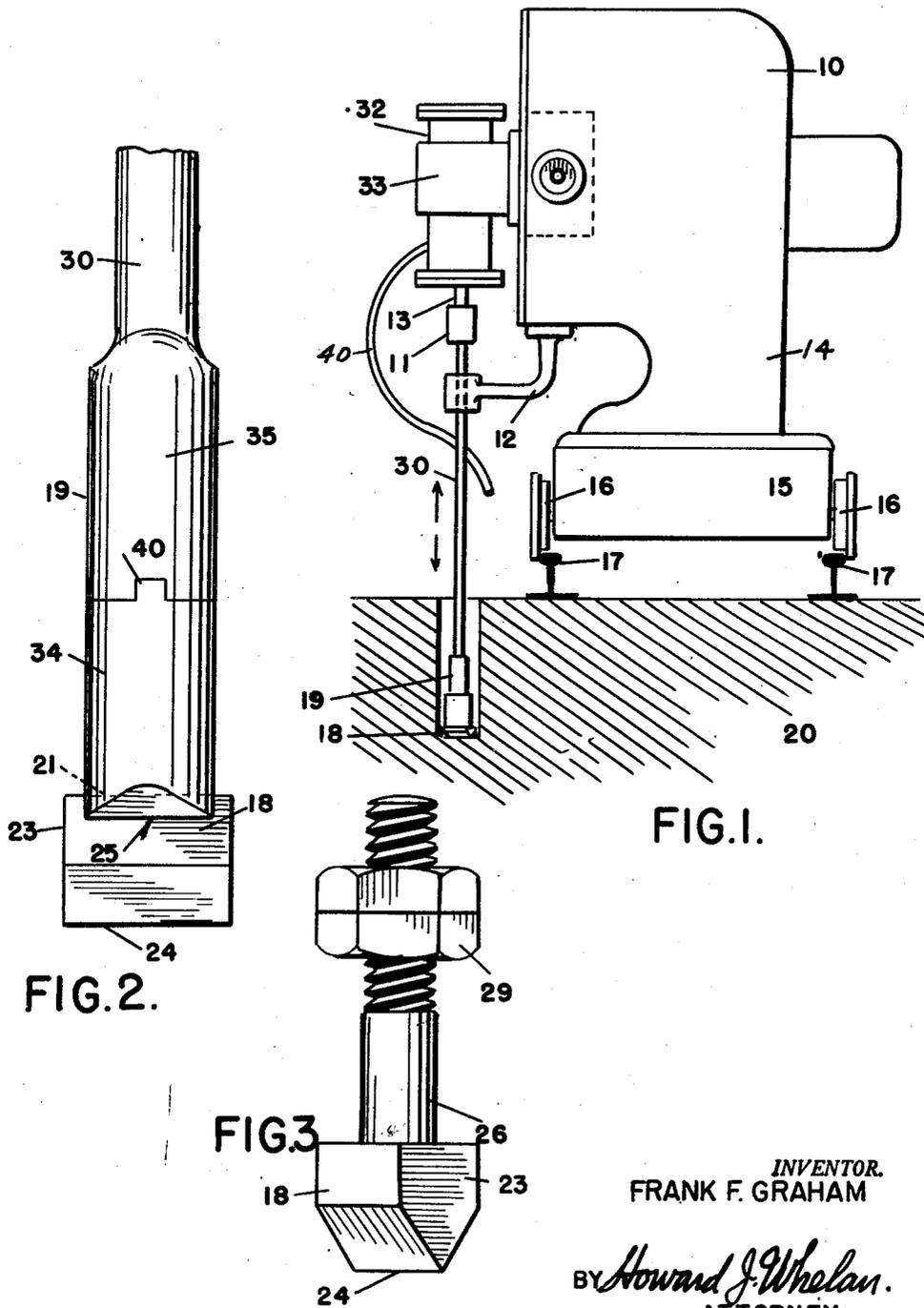


FIG. 1.

FIG. 2.

FIG. 3.

INVENTOR.  
FRANK F. GRAHAM

BY *Howard J. Whelan.*  
ATTORNEY

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2 Sheets-Sheet 2

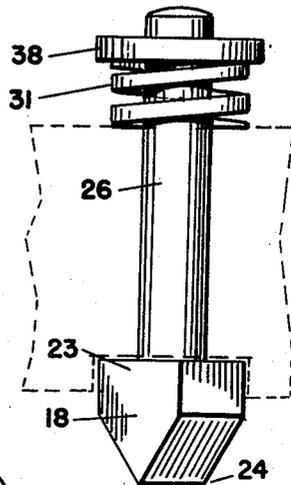
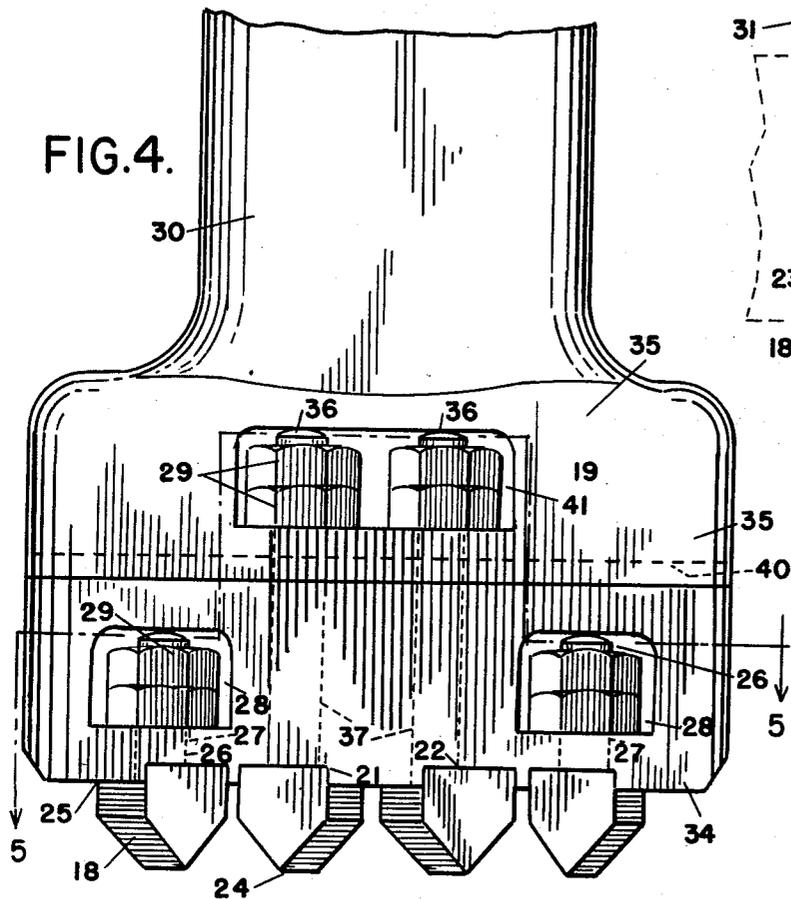


FIG. 7.

FIG. 8.

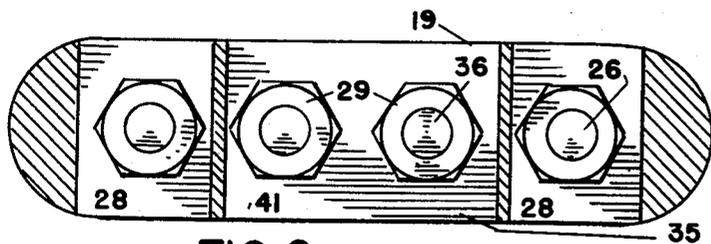
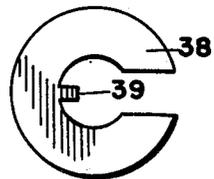


FIG. 5.

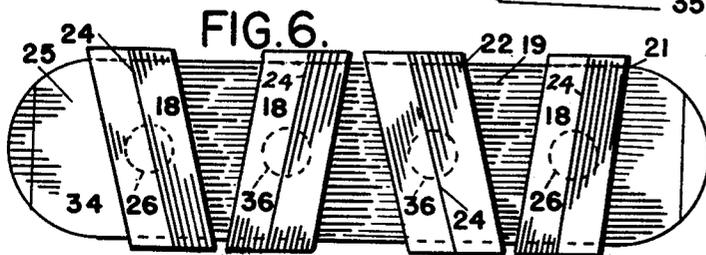


FIG. 6.

INVENTOR.  
FRANK F. GRAHAM

BY *Howard J. Whelan*  
ATTORNEY

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2,710,180

## CHUCK AND BIT ASSEMBLY FOR CHANNELING STONE

Frank F. Graham, Baltimore, Md.

Application January 7, 1953, Serial No. 330,045

2 Claims. (Cl. 262—33)

This invention relates to stone cutting machines and more particularly to those suitable for channeling stone such as marble and similar materials in the rough or resting in a quarry. It is an improvement on U. S. Patent No. 1,995,060, in which a general description of the principles involved are included.

In this invention the construction of the invention is designed to provide means for holding positioning and adjusting the bits or cutters used in channeling the stone into blocks that will take up the wear and keep the bits or cutters properly aligned to do their cutting, without noticeable variation from the original plane of cutting. In the previous patent mentioned, the bit was subject to wear throughout, especially on the bar that held it, and the holes or passages in the latter. The wear subjected the bit and its holder to a loosening effect that resulted in the bit wobbling enough to vary the width and direction of its cutting. Since the cutting of the stone may be channeled to a depth of ten feet or close thereto, the effect of such variation can be very serious, particularly from a commercial or production point of view. This invention enables the user to adjust every individual cutter to its maximum efficiency, independently of the others and without removal from the holder.

The invention therefore has among its objects to provide a new and improved bit for stone channeling purposes, that will avoid one or more of the disadvantages and limitations of the prior art.

Another object of this invention is to provide a new and improved bit for cutting stone that can be adjusted in its holder and without removal from the machine employed in operating or working it.

A further object of this invention is to provide a new and improved bit and chuck for holding it for cutting stone that will include a plurality of cutters, each individually arranged in the chuck and capable of being individually adjusted to take up wear and tear.

An additional object of the invention is to provide a new and improved stone cutter head for holding the cutters, that will permit the arrangement of the cutters as close as practical together, while at the same time being capable of adjustment and ease of manipulation in the use of the tools employed to maintain them.

Still another object of the invention is to provide a new and improved chuck for a stone cutting bit, that can use the cutting means in the bit to hold themselves and the chuck rigidly adjusted and together.

Other objects of the invention will be appreciated as the details thereof are more fully explained.

For a better understanding of the invention, and the objects thereof, reference is made to the accompanying drawings and the following description wherein a particular form of the invention is illustrated, and in which:

Figure 1 is a side elevation of a head assembly and cutters embodying this invention, and mounted on a machine for working it in a quarry;

Figure 2 is an end elevation of the head and cutters used in this embodiment;

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Figure 3 is a detail of one of the cutters used in the head;

Figure 4 is a front elevation of Figure 2;

Figure 5 is a sectional plan view taken on line 5—5 of Figure 4;

Figure 6 is an underview of Figure 4;

Figure 7 is a detail of a modified form of cutter; and

Figure 8 is a plan detail of the keylock washer used in Figure 7.

Similar reference characters refer to similar parts throughout the drawings.

In the construction shown in Figure 1, a portion of a channeling machine 10 of typical form is indicated with a cross-head 11 attached to working bar 30 reciprocating in guide rails 12, and preferably actuated through a piston rod 13 from a suitable motive mechanism of a pneumatic cylinder 32 as shown. A frame 14 supports the cylinder 32 which is adjustable by means of vertical lifting mechanism 33. The frame is moved horizontally on a wheeled carriage 15. The wheels 16 of the carriage run on tracks 17 and align the latter so it will carry the frame 14 and cutters 18 in their head or chuck 19, along the plane of cleavage to be channeled in the stone block 20 being quarried.

The head or chuck 19 is made as narrow as feasible, since it has to travel in the slot quarried by the cutters 18. It is elongated laterally and holds the cutters in line with each other in longitudinal sequence. It is in two sections, the lower section 34 and the upper section 35 being an integral component of the bar 30. The under portion 34 of the head is provided with a series of slots 21 and 22 transversely arranged. The slots 21 are disposed angularly with respect to the axial plane of the head and to the slots 22. This is done to enable the cutters to chop out the stone effectively along the channel. Each cutter is made rectangular at its base 23 for rigid holding with the cutting edge 24 slanted therefrom on a double bevel. The bases fit in the slots 21 and 22 so that their cutting edges 24 will be extended slightly beyond the lower horizontal terminal head face 25 to prevent binding of the chuck in the drilled hole and available for hammering the stone block during the cutting or channeling process somewhat like a "star drill" action. The cutters 18 are integrally mounted on short screw threaded studs 26 axially extending therefrom and made long enough to pass through passages 27 in the lower section 34 of the head and into the widened opening 28. Each opening is made large enough to allow one or two nuts 29 to be installed on the respective stud and manipulated by a wrench. As these nuts are tightened they bring the cutters securely and tightly into their respective slots, where they are relatively immovable. The passages 37 and studs 36 are longer in length at the opening 41 to suit their respective locations in the sections 34 and 35 in the head. The studs 36 hold both sections 34 and 35 together. In this manner it is possible to crowd the cutters close together and make the use of space about the studs economical. The upper section 35 is attached rigidly to the working bar 30 operated by the cross head. The sections 34 and 35 are aligned with one another by means of a dove tail joint 40. The necessary adjustments to increase the depth distance of the head and bar in the cleavage slot as the channeling proceeds in depth are made by moving the cylinder 32 to suit. It can be readily appreciated that the studs and cutters can be tightened by the nuts 29 as often as desirable, without much trouble. Since the cutters are held mechanically stressed under great pressure, their opportunity to loosen is reduced to a minimum. Previously cutters were held in place without any particular stress being placed on them to tension them in position.

In the modified form in Figure 7, the studs are impressed by coil springs 31 strongly tensioned, a keylock

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washer 38 is sprung on the stud to make its lug 39 fit into a transverse hole in the stud. This locks the washer in place holding the spring as shown. This form has features that make the arrangement desirable under particular conditions, and tends to reduce the cost of maintenance, as there is an automatic adjustment of the stud to take up the wear on the cutters, within certain limits.

These types of heads and cutters do not involve any appreciable increase in their cost of manufacture over previous styles. Since however they have manifest advantages and do not require any particular mechanical skill on the part of operators, in their use and operation, they are of a form that is particularly desirable, especially as they have a tendency to reduce the cost of production involved in the quarrying of large blocks of stone.

While but two general forms of the invention are shown in the drawings and described in the specification, it is not desired to limit this application for patent to these particular forms as it is appreciated that other forms could be made that would use the same principles and come within the scope of the appended claims.

Having thus described the invention, what is claimed is:

1. A chuck and bit assembly for channeling stone in-

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cluding a chuck having abutting upper and lower sections, said lower section terminating into a lower horizontal face, there being an opening in the upper section and openings in the lower section vertically offset from the opening in the upper section, passages extending from the lower horizontal face of the lower section and extending upward through both sections to the opening in the upper section, passages extending from the lower horizontal face of the lower section to the openings in the lower sections, studs extending in all of the aforesaid passages to the aforesaid openings, cutters carried by said studs beneath the lower section and nuts carried by said studs within the aforesaid openings.

2. A chuck and bit assembly as set forth in claim 1, wherein the cutters extend transversely beyond the aforesaid lower horizontal face.

#### References Cited in the file of this patent

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