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BIT CONTROL FOR PERCUSSIVE TOOLS

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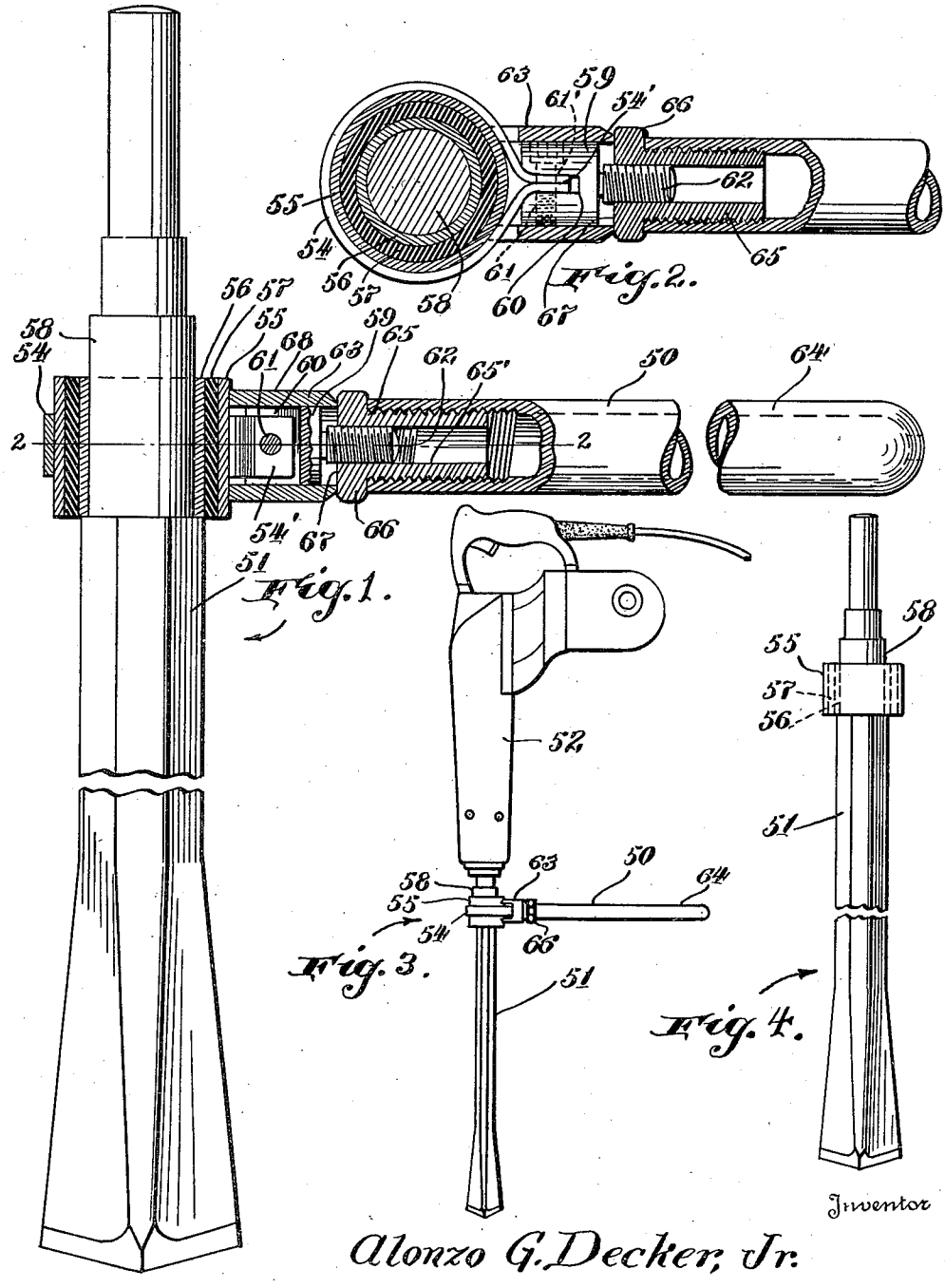


Fig. 2.

Fig. 1.

Fig. 3.

Fig. 4.

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BIT CONTROL FOR PERCUSSIVE TOOLS

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2 Claims. (Cl. 255—43)

This application is a division of application No. 363,811, filed November 1, 1940.

The object of the present invention is to provide an operating handle for directing a drill or other bit; particularly a connection which eliminates or at least greatly reduces the vibration which is transmitted to the handle and hence to the hand of the operator, thus increasing the life of the operating handle and avoiding harmful weariness and inconvenience to the operator and particularly loss of accuracy and efficiency.

The operating handle construction and connection of the invention also limits and reduces the transmission of heat from the bit to the handle and hence to the hand of the operator.

The improved result attained is largely dependent on the provision in the connection between the operating handle and the bit shank of a lost motion which in operation gives relative play to the bit and handle with consequent reduction of the vibratory effect transmitted to the handle. The contact between the bit shank and handle is also reduced and rendered intermittent in operation by said lost motion. The invention also contemplates the use of a resilient cushion between the connecting members which both limits the relative motion and takes up the vibration, and having heat insulating properties reduces the passage of heat below that which occurs in the old type of connection. The cushion is to best advantage held in place by vulcanization to the handle and/or shank giving improved control of the bit.

In the accompanying drawing, I have illustrated a preferred and various modified forms of operating handle embodying the features of the invention, the same being adapted for use with drills and similar bits for operation by percussive tools as electric and other power hammers, particularly those of the portable type.

In the drawing:

Fig. 1 is an elevation of a drill or similar bit for power hammer showing a bit and an operating handle attachment, the connecting means whereby the handle is attached to the bit being shown in vertical section.

Fig. 2 is a fragmentary horizontal section on the lines 2—2 in Fig. 1.

Fig. 3 is an elevation on a reduced scale of an electric hammer equipped with a bit and handle in accordance with Fig. 1.

Fig. 4 is a view on a reduced scale of the construction in Fig. 1 looking from the left in said figure.

Referring to the drawing by numerals:

Figs. 1 to 4 illustrate an operating handle for power hammer bits having a lost motion connection to the bit shank or holder, the lost motion being controlled by an intervening resilient member of rubber or the like which reduces or eliminates the transmission of vibrations as compared to a rigidly attached handle and there is no continuous heat conducting contact, on the contrary the resilient material being non-conducting breaks the heat conducting contact which existed in the prior constructions between the handle and bit and prevents or greatly reduces the transmission of heat from the shank and bit to the handle as well as vibratory action.

Fig. 1 shows an operating handle 50 which is attached directly to a drill bit 51 for a power hammer or the like being equally well adapted for attachment to the bit holder or tool holder and being, in both instances, usable with an electric hammer as indicated at 52 in Fig. 3.

In the construction, Fig. 2, an outer ring 54 encloses an outer sleeve 55 which is encircled by and rigidly attached to the ring 54 in any suitable manner and there is an inner sleeve 56 encircled by sleeve 55 and adapted to fit closely about bit shank 58 and between these sleeves which are concentric and of different diameters and thus spaced or arranged with considerable clearance as indicated, is a band of rubber 57 or the like, of resilient quality and vulcanized or otherwise suitably engaged with both sleeves 56 and 55. The inner sleeve 56 aforesaid fits closely on the shank 58 or any suitable shank attached in operative relation, as previously described, to bit 51.

According to the present practice the inner sleeve 56 assembled with the rubber 57 and outer sleeve 55 with or without the handle ring 54, these parts being known as the ring section are forced down over the shank 58 which may be integral with the bit or otherwise adapted for rigid connection thereto.

It is of interest that the operating handle 50 is easily and quickly removable being, as shown in these figures, made in two pieces for this purpose. This construction is not regarded as essential to the other features described. The ring portion or ring end of the handle as shown is indicated by reference character 68.

In the construction shown in Figs. 1, 2, 3, and 4 the ring end of the handle includes a tube or short sleeve 63 within which is a slotted stud or cylindrical block 59, the split or slot 60 therein containing the projecting ends 54' of the band of which said ring 54 is formed. These ends are bored in registration at 61' and are secured by a transverse bolt 61 in said bored holes which ex-

tend through said block. The block 59 has projecting from its outer end and in an axial direction a screw 62 which is integrally secured to said block.

The outer manually engaged section of the handle 50, indicated by reference character 64 is shown as of tubular form and is provided at its inner end with an internally screw threaded socket or the like 65, enclosed in the tube and bored at 65' in line axially with the tube axis. This socket is threaded to fit screw 62 and is shown as having a flange or nut portion at 66 presenting a forward surface 67 to the end of said sleeve 63 or the ring end of said handle. The sleeve 63 is held in position by the flange 66, the face 67 of which is forced against the end of said sleeve when the handle section 64 is tightened up on the screw 62 engaging socket 65.

Sleeve 63 may be removed to provide for the removal of the bolt 61 to change the ring band 54 and other elements 55, 56, 57 of the attaching ring or section by first unscrewing and removing the handle section 64.

It will be noted that the handle attachment described in connection with Figs. 1 to 4, due to the resilient element 57 between the handle 55 and the bit, shank provides lost motion between the bit and handle and that the lost motion is available to provide suitable play both in the direction of the hammer blow and about the bit axis and laterally and that it provides a limited rotative play about the bit axis as well as a yielding action in the direction of said axis and of the hammer blow. It is also of interest that the functions of stops or stop surfaces both parallel to the blow and transverse to the direction of the same are best served by the type of connections shown.

An additional accomplishment incident to the construction above described is that in addition to the lost motion of the operating handle relatively to the bit as previously described, this construction provides a resilient control of the bit within the limits of the said lost motion and at the same time the vibration due to the impact of the hammer on the bit is greatly reduced as transmitted to the handle and in this way the harmful effect due to crystallization of the handle and manual strain are greatly reduced or eliminated. It is also apparent that due to the nonconductive properties of the rubber, little if any of the heat generated by the action of the hammer or the bit is transmitted to the handle. Thus the harmful effects on the operator of both the vibration and heating which formerly reduced the efficiency of operation and particularly the efficient control by the operator are overcome or eliminated.

It may be noted that the knock-down feature whereby the ring 54 is removable from the handle provides for convenience of repair and replacement of worn or broken bits and other parts, and for removal of the handle from the bit for packing, shipping, and the like.

The operation of the bit controlling handle and connection disclosed and the accomplishment of the invention have been fully discussed in the preamble and in connection with the form described.

In the form shown the handle engages with a lost motion connection the shank of the bit or bit holder either of which shanks is in operation rigidly connected to the cutting end of a bit. Such a shank or equivalent member is adapted for use in impact receiving relation to and with a power hammer and operates only in impact transmitting relation to the cutting end of a bit.

It may also be noted that while the play of the bit relatively to the handle is limited, it is, in the preferred form, effective in all directions and hence may be defined as universal, being dampened and restricted by the cushions.

I have thus described a preferred form of the invention, the description being specific and in detail in order that the manner of constructing, applying, operating and using the invention may be fully understood, however, the specific terms herein are used in a descriptive rather than in a limiting sense, the scope of the invention being defined in the claims.

What I claim as new and desire to secure by Letters Patent is:

1. The combination with an impact receiving shank for a power hammer bit of a directing handle for the bit, said handle having a ring portion encircling the shank, the inner periphery of said ring being considerably larger than the shank, a second ring of outside diameter less than the inside diameter of the first said ring and located within the first said ring and a rubber cushion between said rings and vulcanized to both said rings, said second ring encircling and closely engaging the shank.

2. The combination with an impact receiving shank for a power hammer bit of a directing handle for the bit, said handle having a ring portion encircling the shank, a second metal ring of outside diameter less than the inside diameter of the first said ring and a rubber cushion between said rings and attached to both said rings, the second ring encircling and closely engaging the shank.

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