

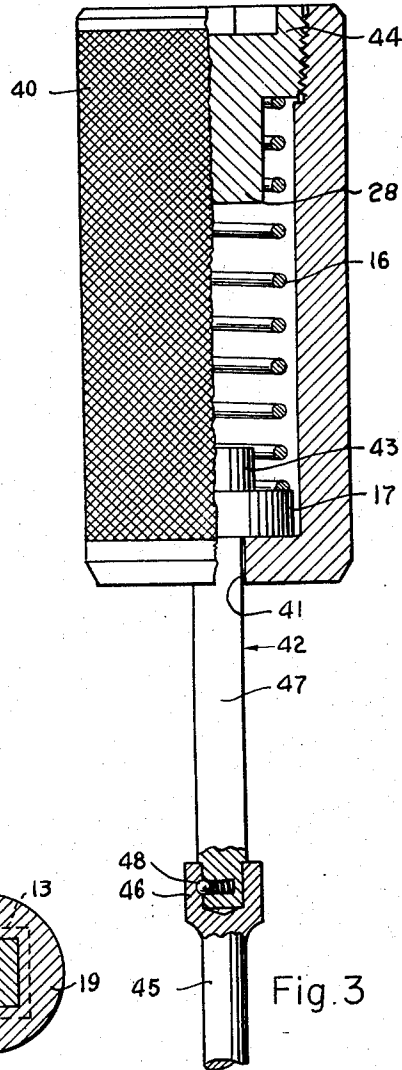
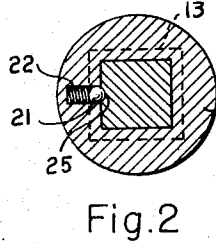
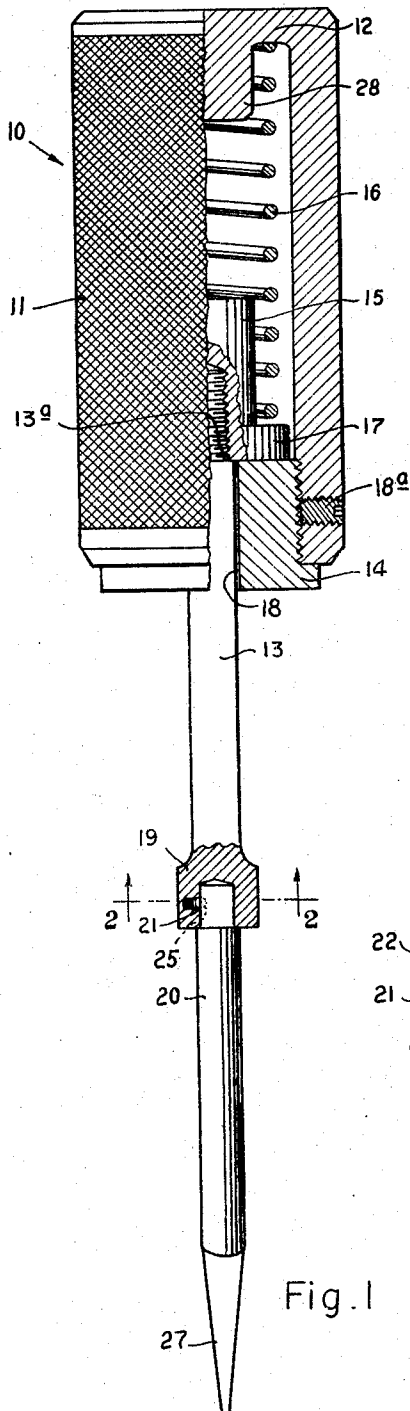
Sept. 15, 1959

P. A. MCGONAGILL

2,903,932

AXIAL IMPACT TYPE HAND TOOL

Filed June 27, 1957



Patrick A. McGonagill
INVENTOR

BY *Herbert H. Hickey*
ATTORNEY

1

2,903,932

AXIAL IMPACT TYPE HAND TOOL

Patrick A. McGonagill, Mount Pleasant, Tex.

Application June 27, 1957, Serial No. 668,352

3 Claims. (Cl. 81—52.35)

This invention relates to impact tools and more particularly to a hand impact tool for use in metal working such as straightening auto bodies, fenders or the like. The tool is also usable to simultaneously transmit a torque and an impact blow to a device such as a screw as an aid in loosening said screw.

An object of the invention is to provide a new and improved impact tool which will deliver a blow with small effort and which is simple and of economical construction.

Another object of the invention is to provide an impact tool of the character described wherein the point or tip is interchangeable with other points or tips.

Yet another object of the invention is to provide an impact tool of the character described wherein the plunger or shank holding the bit is prevented from rotating with respect to the movable handle.

Additional objects and advantages of the invention will be readily apparent from the reading of the following description of devices constructed in accordance with the invention, and reference to the accompanying drawings thereof, wherein:

Figure 1 is a view, partly in section and partly in elevation, of one form of the invention, showing the same in position to deliver a power stroke;

Figure 2 is an enlarged cross-sectional view taken on the line 2—2 of Figure 1; and,

Figure 3 is a view similar to Figure 1, showing a modified form of the invention.

Referring now to the drawings, particularly to Figures 1 and 2, the impact tool 10 is shown to include a heavy tubular handle or body 11 whose upper end 12 is closed. A plunger or shaft 13 extends upwardly through a bushing 14 threaded into the lower end of the handle and is threaded into, welded or otherwise secured to an anvil or head piece 15 slidably disposed in the body. An upwardly facing shoulder 13a on the upper or inner end of the head on the plunger engages the lower face of the anvil to provide a solid metal-to-metal contact therebetween. A spring 16 is positioned in the bore of the body and engages the upper end of the body and a flange 17 on the anvil to urge the anvil outwardly of the bore of the body. A hammer head 28 projects inwardly into the bore from the upper end of the body and is surrounded by and serves to guide the upper portion of the spring. The hammer head is designed to strike and impart a solid blow or impact to the upper end of the anvil in a manner to be more fully hereinafter described. The shaft 13 is of a cross-section other than round, and is shown as being square, the bore 18 through the bushing corresponding in cross-sectional configuration to that of the shaft to prevent rotation of said shaft relative to the bushing about its longitudinal axis. A set screw 18a holds the bushing in place in the body.

A socket 19 is formed on the lower end of the plunger to receive the upper end of a bit 20. The socket and the upper end of the bit correspond in cross-sectional configuration and have a configuration other than round.

2

As shown, the socket and bit are square in cross-section.

A spring pressed ball 21 is disposed in a lateral bore 22 in the inner wall of the socket and engages in a depression 25 in a flattened side of the upper end of the bit to releasably hold said bit in position in the socket in the usual manner.

In use, the point 27 of the bit is placed in contact with the metal to be worked and the handle or body is grasped by the operator. The handle is moved sharply downwardly or toward the plunger, the spring 16 being compressed until the hammer head 28 projecting inwardly from the upper end of the handle strikes the upper or inner end of the anvil 15, thus delivering a blow to the plunger and the bit. The handle is then moved away from the plunger, the spring 16 maintaining the bit in contact with the metal or other material being worked. Additional strokes are made with the handle to work the metal as desired.

The mass of the handle is large with respect to that of the plunger and the bit, while the force developed within the spring 16 is relatively small so that a great amount of kinetic energy is developed by the moving handle and applied by means of the blow delivered to the plunger or shaft to work the metal or other material in the manner desired.

If desired, the bit 20 may be replaced by tools of other configuration, for example, the bit may be curved or offset for reaching otherwise inaccessible locations, the shaft 13 and the bore 18 through the bushing maintaining the bit in proper orientation with respect to the handle.

It is apparent that a screwdriver point may be provided on the bit so that the device may be used as a screwdriver. Impact blows may be delivered by the tool to the screw to start or to loosen said screw, a torque being simultaneously applied to the screw by virtue of the non-circular bore 18 and the shaft and the socket 19 and the corresponding upper end of the bit.

In Figure 3 is shown a modified form of the invention wherein the tubular handle 40 is formed with a closed lower end having a bore 41 therethrough. The plunger 42 is formed with an integral anvil or head 43 and is inserted through the open upper end of the handle. A closing plug 44 having a downwardly projecting hammer head thereon is threaded into the upper end of the handle to retain the plunger in said handle and deliver blows thereto. The plug also engages the spring 16 to urge the plunger downwardly, the hammer head guiding the spring in the manner previously described.

The bit 45 is provided with a socket 46 on its upper end, said socket receiving the lower end of the shaft 47 of the plunger. The shaft is provided with a spring-pressed ball which engages in a recess 48 in the socket to releasably hold the bit on the shaft.

Manifestly the cross-section of the shaft and the bore 41 may be of any desired corresponding non-circular configurations to prevent rotation of the shaft relative to the handle about its longitudinal axis, if desired.

The operation of this form of the impact tool is the same as that of the previously described form. That is, the end of the bit is placed in contact with the metal to be worked and the handle is moved sharply toward the plunger, the hammer head 28 striking the anvil 43 to deliver a blow to the plunger and the bit and thereby to the work.

Thus it will be seen that an improved impact tool has been shown and described wherein a blow is delivered by moving a handle into contact with a plunger. It will be seen that the bit of the tool is readily interchanged with other bits of various types and that the bits are releasably held in place on the plunger.

It will be seen that the plunger may be positively pre-

vented from rotating relative to the handle so that a curved or offset bit may be used whereby non-axial blows may be delivered if desired. It will also be seen that a torque may be transmitted through the handle to the bit and that impact blows can be delivered simultaneously with such torque.

Obviously, if desired, the bit can be made integral with the plunger or shaft in either form of the invention.

The foregoing description of the invention is explanatory only, and changes in the details of the constructions illustrated may be made by those skilled in the art, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. An axial impact tool including: a massive handle having an enlarged longitudinal bore therein; means closing one end of said bore; a flange partially closing the other end of said bore and having a non-circular aperture therein; a shaft slidably extending through said aperture and corresponding in cross-sectional configuration with said non-circular aperture to prevent rotational movement between said shaft and said aperture about their longitudinal axes; a head on said shaft disposed in said bore and engaging said flange to limit outward movement of said shaft in said handle; a spring in said handle engaging said head and biasing said shaft toward said flange; and a striker member on said closing means extending into said bore and engaging the inner end of the head on said shaft to impart a blow thereto on inward movement of said shaft in said handle before said spring is fully compressed, the mass of said striker member being great relative to the mass of said shaft.

2. An axial impact tool including: a shank; a massive handle slidably mounted on said shank and having a longitudinal bore of considerably greater diameter than the diameter of said shank; a first cap on the handle closing one end of said bore; a second cap on the handle for closing the other end of said bore and having an aperture therein; said shank extending through said aperture and said aperture closely surrounding said shank; a collar fixed on the shank within the bore and normally

resting against the apertured cap; a spring in said bore bearing at one end against said collar and at its other end against said first cap; a striking hammer on said first cap extending downwardly into the bore within the spring and engaging the collar on compression of the spring; said hammer engaging said collar before said spring is fully compressed; the aperture being other than round and said shank conforming cross section to said aperture; a bit removably secured to the exposed end of said shank; and means connecting said bit and said shank and preventing rotational movement therebetween.

3. An axial impact tool including: a large diameter handle having an extensive longitudinal bore therein open at one end; a shaft telescopically disposed in said open end of said bore and slidable longitudinally in said bore between an outer extended position and an inner retracted position; closure means closing the other end of said bore; a head on said shaft disposed in said bore; means on said handle engaging said head to limit outward movement of said shaft from said handle; a spring in said handle engaging and biasing said handle outwardly; said closure means having an impact surface engaging the head of said shaft to limit inward movement of said shaft in said handle and also to impart a blow thereto; said handle being of large mass relative to said shaft and head; and means on said shaft and said handle preventing rotational movement therebetween about the axis of said shaft.

References Cited in the file of this patent

UNITED STATES PATENTS

863,909	Evans	Aug. 20, 1907
913,677	Ainsworth	Mar. 2, 1909
947,391	Michael	Jan. 25, 1910
987,355	Godwin	Mar. 21, 1911
1,458,961	Williams	June 19, 1923
1,521,265	Anderson	Dec. 30, 1924
1,952,395	Tillyer et al.	Mar. 27, 1934
2,455,270	Ravella	Nov. 30, 1948
2,787,178	Maxim	Apr. 2, 1957
2,796,101	Hasemann et al.	June 18, 1957