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PLUNGER ACTUATED DENT LIFTING TOOL

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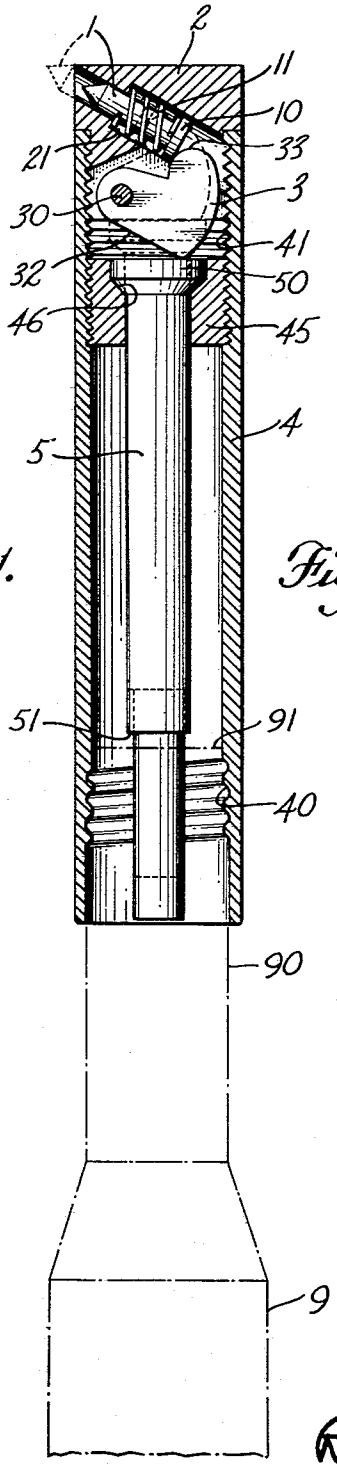


Fig. 1.

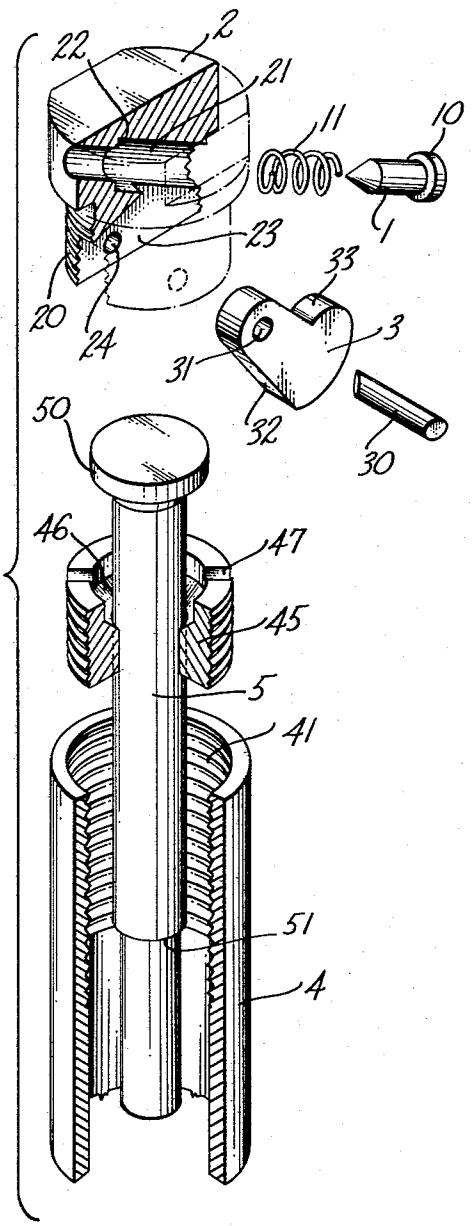


Fig. 2.

INVENTOR.
JAMES W. GELLER

BY
Reynolds, Beach & Christensen
ATTORNEYS

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PLUNGER ACTUATED DENT LIFTING TOOL

James W. Geller, Nampa, Idaho

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4 Claims. (Cl. 81—15)

The present invention concerns a tool for use with a common air hammer to perform various operations, particularly when the point where a repeated force is to be applied is inaccessible except by extensive disassembly. An example of such a use is found in automobile body work in lifting dents which are in body panels or doors, the interior of which is relatively inaccessible. The tool is usable in such instances as a pecking tool whereby to lift such dents and to restore the smooth continuity of the surface. By substitution of different styles of tool points, the tool as a whole may be employed for diverse operations, as, for example, for riveting in such inaccessible locations.

While it is known to apply to air hammers or the like an attachment of this general nature, it is an object of the present invention to provide such an attachment or pecking tool which is of simple construction, compact enough to function properly in the restricted space indicated and at a distance from the point of entry, and easily assembled or disassembled, and in which as a result the working tool point may readily be replaced when worn.

With such objects in mind, and others as will appear more fully in detail hereinafter, the present invention comprises the novel pecking tool as an attachment for an air hammer or the like, as shown in the accompanying drawings in a preferred form, and as will be more fully explained hereinafter and defined in the claims which terminate this specification.

Figure 1 is an axial sectional view of the tool shown with parts in the fully assembled relationship, and in operative disposition to the nose of an air hammer.

Figure 2 is an isometric view, partly in section, showing the several parts exploded to illustrate the simplicity of their assembly into operative relationship.

Such a tool is intended for application to any suitable air hammer, the air hammer being indicated as a whole at **9** in Figure 1, and it is intended that the tool shall be removably applied to the nose **90** of the air hammer as, for example, by threading it upon the exterior of the nose. Hammers with which such a tool will be most efficiently operable should have a valve such as will allow the operator to control the force of the blow to be struck. The number of blows which the hammer will deliver may be anywhere from nine hundred to four thousand per minute, although, of course, it is not to be understood that a hammer capable of delivering single blows is not sometimes usable to advantage with the present tool. Details of the hammer and its controls are omitted here, since the hammer in itself forms no part of the present invention.

The tool of this invention incorporates a tubular barrel **4**, of whatever length may be desired to gain access to a distant part of the interior of a closed space, and of slight diameter so that it can operate in such a space, such as the body panel of an automobile, and this barrel is interiorly threaded at one end as indicated at **40**, or is otherwise formed for attachment to the nose **90** of the air hammer. The barrel is likewise threaded interiorly

at its opposite end, as indicated at **41**. A head **2**, which preferably is no larger in diameter than the barrel, is threaded complementally to the threads **41**, as indicated at **20**, and is assembled upon the end of the barrel. This head is formed with a laterally inclined stepped bore **21**, one (the smaller) end of which opens to the exterior of the head **2** beyond the end of the barrel **4**, whereas the opposite (larger) end of the bore **21** opens to the reduced, threaded portion of the head, that portion which when assembled is within the interior of the barrel, which in turn closes the bore. This bore is stepped or shouldered, as is indicated at **22**, the shoulder being located nearer the outer end of the bore and facing inwardly.

Within this bore **21** is insertable from its inner end a tool point such as the pecking tool **1**. The point of the tool is suitably shaped for the operation it is intended to perform, and at the opposite or inner end the tool is flanged, as indicated at **10**, the flange **10** being of a size to fit the bore **21** snugly, and the tool point **1** being of a size to fit the smaller outer portion of the bore, outwardly of the shoulder **22**. Interposed between the shoulder **22** and the flange **10** is a compression spring **11** which serves to urge the tool into and to hold it in its retracted position, as shown in full lines in Figure 1, but which will permit its projection into operative position, as shown in dotted lines in that figure. The wall of the barrel, when the head with its tool point is threaded home, would prevent ejection or loss of the tool point, although another element, about to be described, better serves that purpose.

The inner or lower end of the head **2** is diametrically slotted, as is indicated at **23**, and in this slot is received a hammer arm **3**. This hammer arm is pivotally mounted by a pin **30** which passes through the transverse bore **31** in the hammer arm and complemental holes **24** in the head **2**. The location of the pivot axis is preferably at one side, beneath the pecking point **1**, and somewhat offset from the flange **10** at the inner end of the pecking point **1**. In addition, it is preferred that the under face of the hammer arm **3** be flattened, or made straight, as shown at **32**. The pin **30** secures the hammer arm **3** to the head **2** in position where its striking nose **33** bears against the inner end of the tool point **1**, and the spring **11** urges the hammer arm toward a position of rest.

A plunger **5** is located within, preferably coaxially of, the barrel **4**, and is guided therein for longitudinal reciprocation. Preferably it is guided in a separate collar or plug **45**, which is also exteriorly threaded to fit the threads **41** of the barrel, and which is axially bored for the reception and guiding of the plunger **5**. This plug **45** may be shouldered at its upper end, as indicated at **46**, in which case the plunger will be provided with an enlarged head **50** which will seat on the shoulder **46**, and the downward or retractive movement of the plunger will be thereby limited. Alternately, the plunger may have a shoulder **51** which will engage the end face **91** of the air hammer's nose **90**, for the same purpose. By correctly locating the plug **45**, screwing it in to the barrel in advance of the head **2**, and in correct position axially with relation to the head **2**, the lower point of the hammer arm **3** will bear upon the head **50** of the plunger; the seating of the plunger on the shoulder **46** or on the end face **91** will limit retractive movement of the hammer arm and of the pecking tool **1**, and yet upward or outward movement of the plunger **5** will serve to project the tool point **1** sharply. It will be noted that the parts are relatively so located that when the plunger **5** has been projected, it will contact the flat surface **32** of the hammer arm and will thereby serve to limit the upward movement of the plunger, the swinging of the hammer arm about its pivot **30**, and the amount of force to be applied through the plunger and the hammer arm **3** to the tool point **1**. This disposition of parts is shown in dash lines in Figure 1.

The plunger **5** is of such length as will permit it to enter the nose **90** of the air hammer **9** to the extent sufficient that it will be struck by the plunger (not shown) of the air hammer and projected to the extent desired, with each reciprocation of the air hammer's plunger.

It will be observed from Figure 2 that the assembly or disassembly of the pecking tool is an extremely simple matter; for replacement or substitution of one point **1** for another, all that is needed is to unscrew the head **2**, whereupon the tool **1** is readily removed from the interior of the bore **21**, and a substitute tool may be as simply replaced. The hammer arm **3**, if it becomes worn, may be as simply replaced. The plunger **5** can be removed without more than removal of the head **2**, or if desired, the plug **45** is very easily removed by applying a spanner tool to its end slots **47**. The assembled tool as a whole is applied to an air hammer by screwing it in place on the nose **90**, or if the hammer is otherwise formed for the reception of attachments, a different barrel **4** may be provided with complemental securing means for attachment upon this particular air hammer nose.

The substitution of a riveting head for the pecking point illustrated has already been mentioned. A chipping chisel may be substituted and the tool may thus be used for chipping away excess weld metal, or slag, from welded seams in interior locations. It will be evident that the barrel **4** and the plunger **5** may be made of whatever length is desired, and thus can accomplish the desired work at quite a distance from the air hammer itself, and in locations which otherwise would be completely inaccessible.

I claim as my invention:

1. A dent lifter, for use with an air hammer or the like, comprising a barrel formed at one end for securement upon the nose of the air hammer, to project thence forwardly, a cylindrical head located adjacent the barrel's opposite end, and of a diameter equal to or less than the diameter of the barrel, and having a laterally inclined and shouldered guide bore open to the exterior of said cylindrical head, a headed pecking point guided therein for projective and retractive reciprocation, a coil spring interposed in said bore between its shoulder and the pecking point's head, biasing said pecking point towards its retracted position, a hammer arm pivotally mounted within the barrel, in position to engage the inner end of said pecking point, and to project the latter when the hammer arm is rocked, a plunger extending lengthwise of and guided within said barrel, in position such that its one end will engage said hammer arm and its opposite end may be engaged by the air hammer's plunger when the barrel is secured upon its nose, and stop means on the plunger interengageable with complemental stop means fixed relative to the barrel, to limit retractive movement of the plunger, hammer arm, and pecking point under the influence of said coil spring.

2. A dent lifter as in claim 1, wherein the hammer arm and the plunger, at the end which engages the hammer arm, have complemental flat faces, and the pivotal mounting of the hammer arm is in line with a portion of the plunger, offset from the latter's axis, to limit the projective movement of the plunger, and hence the force of the blow imparted to the hammer arm and, through it, to the pecking point.

3. A dent lifter, for use with an air hammer or the like, comprising a tubular barrel formed at one end for securement upon the nose of the air hammer's casing, to project thence forwardly, and interiorly threaded at its opposite end, a cylindrical head of a diameter equal to or less than the exterior diameter of the barrel, threadedly engaged within the latter end of the barrel, and having a laterally inclined guide bore, formed with an inwardly facing shoulder, said bore opening at its outer end to the exterior of the head and at its inner end to the threaded portion of the head which is received within the barrel's interior, a pecking point guided within said bore and formed with a flange facing said shoulder, a compression spring interposed between said shoulder and said flange to urge the pecking point towards retracted position, said head being diametrically slotted in its threaded portion, a hammer arm pivotally mounted upon said head, within the head's slot, in position to engage the inner end of the pecking point, and to be rocked by the pecking point and said spring to a position of rest, or to project the pecking point when the hammer arm is rocked from such position of rest, a plunger extending lengthwise of and within the barrel and guide means therefor to locate the plunger in position to engage the hammer arm by one end and to be engaged and projected by the air hammer's plunger when the barrel is secured upon its nose, and stop means on said plunger, and complemental stop means fixed relative to its guide means, to limit retractive movement of the plunger, hammer arm, and pecking point under the influence of said compression spring.

4. A dent lifter as in claim 3, wherein the plunger's guide means is formed as an axially bored plug exteriorly threaded for engagement within the threaded end of the barrel, in advance of such engagement of the head therewith.

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