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2,943,524

PNEUMATICALLY-OPERATED, SLIDABLE INNER JAW WRENCH

Filed Jan. 2, 1959

2 Sheets-Sheet 1

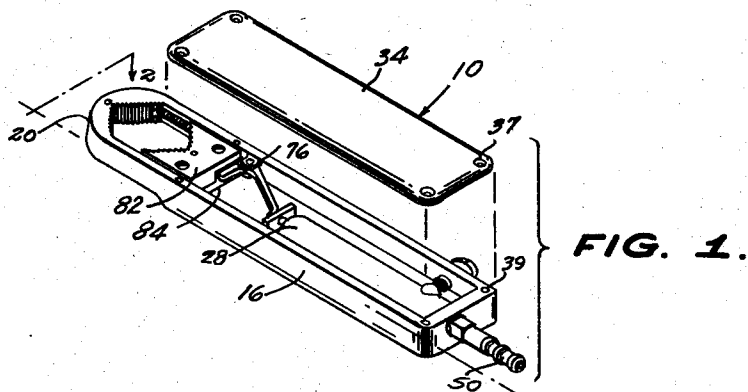


FIG. 2.

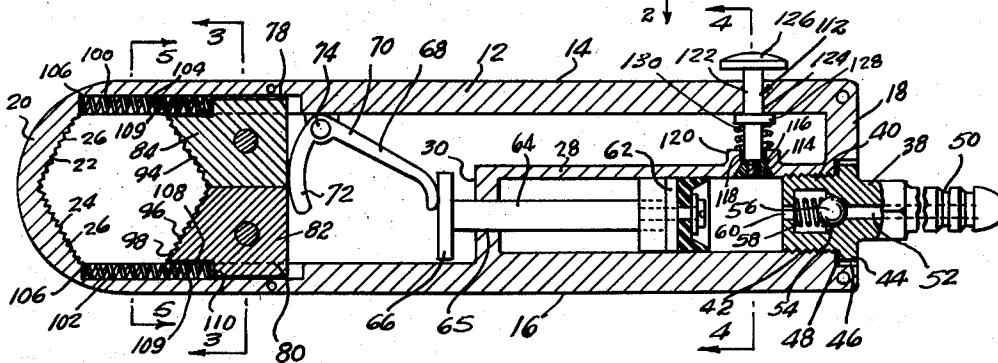


FIG. 3.

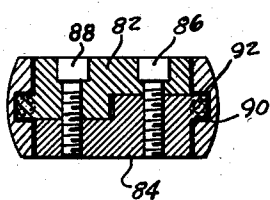


FIG. 4.

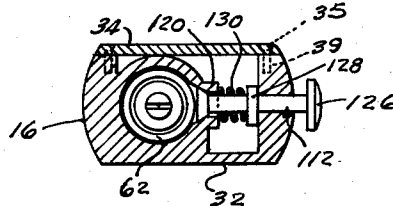
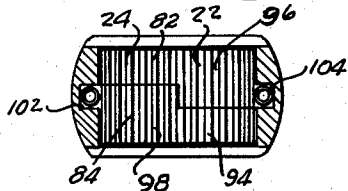


FIG. 5.



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2 Sheets-Sheet 2

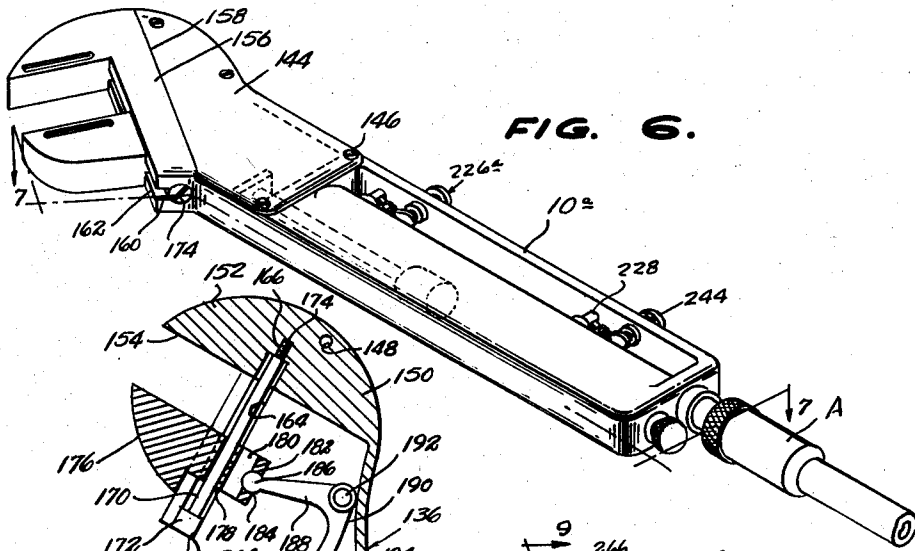


FIG. 6.

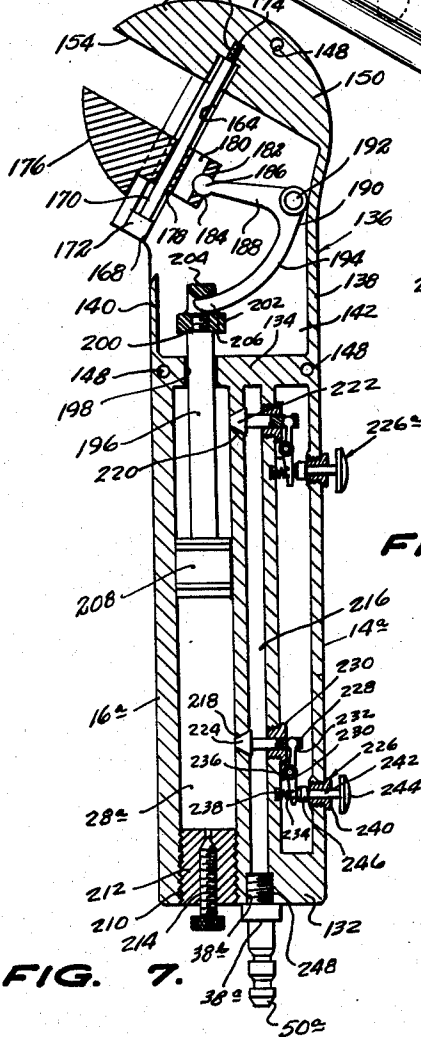


FIG. 7.

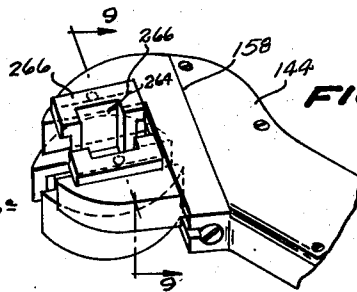


FIG. 8.

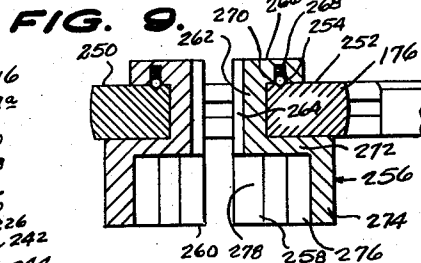


FIG. 9.

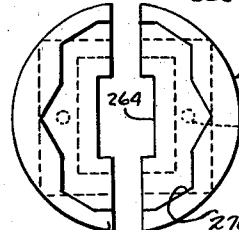


FIG. 10.

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2,943,524

PNEUMATICALLY-OPERATED, SLIDABLE INNER JAW WRENCH

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6 Claims. (Cl. 81-129)

The present invention generally appertains to improvements in fluid operated tools and, in particular, is directed to a novel and improved fluid operated tool of the wrench or pliers type, which is used to grip and rotate a workpiece.

A primary object of the present invention is to provide a pneumatically actuated wrench wherein one jaw is moved relative to a companion, fixed jaw by means of compressed air acting through a simple and sturdy mechanical structure.

The present invention comprehends the provision of any type of jaw structure, wherein one jaw is moved relative to a complementary fixed jaw so as to clamp on a work piece, such as a nut. The jaw structure may vary, in accordance with the present invention, so that the wrench may be of any conventional jaw design as a box, open, socket, Stillson or the like wrench.

The primary aim and purpose of this invention is to move the movable jaw of any type wrench relative to a companion fixed jaw by utilizing compressed air which actuates a piston working in a cylinder and connected to the movable jaw by a mechanical leverage connection.

One important environment for the present invention is in the automotive repair field. It is proposed to utilize a conventional air tank assembly, such as is found in a garage or repair shop, as the source of compressed air and to provide means for connecting the air hose to the tool of this invention. Because of the construction of the tool, a mechanic can use the one tool for removing and fastening various and sundry sizes and types of bolts and other fasteners while remaining under a vehicle, as he repairs it. This avoids the present necessity to have a large number of various size and type wrenches at hand.

Another important object of the present invention is to provide a pneumatically operated wrench which comprises a handle member that serves as a support and housing for an air cylinder and to provide a mechanical leverage connection from the piston in the air cylinder to the movable jaw of the wrench. The air cylinder and mechanical connection are formed and mounted so that there is no inconvenience involved in gripping and holding the handle member and so that the tool will be easy to handle and use without interfering with the gripping action of the jaws.

Another important object of the present invention is to provide guide means for guiding the movable jaw and to provide a crank type lever means between the piston rod in the air cylinder and the movable jaw so that a maximum leverage is realized.

A further important object of the present invention is to provide valve means so that once the movable jaw has been set, by the action of the compressed air, in the desired relation to the fixed jaw, the air hose can be detached from the air cylinder without any possibility of movement of the movable jaw.

A further important object of the present invention is to provide valve means for controlling the movement of

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the movable jaw whereby the compressed air is used to move the movable jaw toward and away from the fixed jaw and to maintain it in any set position.

A further important object of the present invention is to provide means for conveniently and easily changing the jaw design and thereby converting the tool from one type wrench to another.

A still further important object of the present invention is to provide a simple, compact and inexpensive pneumatic wrench, which can be easily and effectively employed for any type of work holding or clamping duty.

The foregoing and ancillary objects are attained by this invention, the preferred embodiments of which are set forth in the following description and illustrated in the accompanying drawings, wherein,

Figure 1 is a perspective view of a pneumatic closed or box type wrench, constructed in accordance with the principles of this invention;

Figure 2 is a longitudinal, horizontal sectional view, taken on line 2-2 of Figure 1;

Figure 3 is a transverse sectional view, taken on line 3-3 of Figure 2;

Figure 4 is a transverse sectional view, taken on line 4-4 of Figure 2;

Figure 5 is a transverse sectional view, taken on line 5-5 of Figure 2;

Figure 6 is a perspective view of a modified form of this invention, showing a pneumatic open type wrench which is constructed in accordance with the principles of the present invention;

Figure 7 is a longitudinal, horizontal sectional view, taken on line 7-7 of Figure 6;

Figure 8 is a modified form of jaw structure, showing a socket wrench attachment which can be used to convert the wrench of Figure 6 into an adjustable socket wrench;

Figure 9 is a cross-sectional view, taken on line 9-9 of Figure 8, and,

Figure 10 is a top plan view of the jaw arrangement of Figures 8 and 9.

Referring now more particularly to the accompanying drawing, and initially to Figures 1-5, the reference numeral 10 generally designates a pneumatically actuated wrench, which is constructed in accordance with this invention. The wrench 10 includes a housing 12, which is defined by longitudinally extending, parallel side bars 14 and 16, which are spaced apart transversely and which are connected at one of their ends by a transverse end bar 18, which is integral with bars 14 and 16 and constitutes the inner or rear end of the tool. The side bars 14 and 16 are connected at their opposing ends by an arcuate end portion 20. The inner face of the end 20 is formed in the shape of a triangle and the rearwardly diverging sections 22 and 24 of the triangular inner face define fixed jaws, with the surfaces being provided with gripping teeth 26.

A cylinder 28 is formed integral with the inner surface of the side bar 16, such inner surface defining a portion of the wall of the cylinder, as shown in Figure 4. The cylinder is also formed integral with the end bar 18 and is completed by means of a closed end 30. Thus, the cylinder lies contiguous with the end bar 18 and the side bar 16 and is of a diameter to be disposed within the coplanar top and bottom edges of the side bars 14 and 16. In this regard, a side plate 32 is provided and is formed integral with the side bars and the cylinder. The opposite side of the housing is open and is adapted to be closed off by a cover plate 34. The cover plate 34 is mounted on the side bars by means of fasteners 35 that pass through holes 37 in the cover plate and are threaded into openings 39 in the side and end bars.

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A fitting 38 is provided with an inner, externally threaded end 40, that is threaded into the internally threaded rear end 42 of the cylinder 28. The fitting has an external annular shoulder 44 that seats in the counterbored end 46 of the cylinder, with a suitable gasket 48 being provided for sealing off the end of the cylinder. The fitting terminates at its outermost, rear end in a connector 50, which is externally grooved and formed to receive a conventional connector on a conventional air hose, such as is a part of a conventional air tank assembly, as found in an automotive garage or repair shop.

The fitting is formed with an axial bore 52, which terminates at its inner end in a counterbored valve seat 54. A check valve 56 is seated in the valve seat and is urged by a spring 58 into such seated position. A port 60 is formed in the closed end of the portion 40 of the fitting and is aligned with the bore 52, so that, upon the application of the air hose to the connector 50 and the introduction of compressed air into the fitting, the ball valve 56 is unseated, against the urging of the spring, and the compressed air passes through the bore 52 and the port 60 into the interior of the cylinder.

A piston 62 is slidably disposed in the cylinder and is provided with a piston rod 64, which sealingly and workably extends through an opening 65 in the closed inner end 30 of the cylinder. The piston rod terminates at its exterior forward end, in a disc 66, which bears against the free end of an arm 68 of a crank lever 70. The lever 70 is pivoted at the juncture of its arms 68 and 72 by means of a pivot pin 74. The pivot pin 74 is mounted in a pair of apertured ears 76, which project laterally and inwardly from the inner surface of the side bar 14.

The arm 72 is arcuate and bears at its outer, convex side 78, against the movable jaw assembly 80, which is adapted to be urged relative to the fixed jaw sections 22 and 24.

As shown in Figures 3 and 5, the movable jaw assembly 80 is composed of a pair of jaw elements 82 and 84. The jaw elements have complementary stepped and interfitting portions and are held together by screws 86 and 88. Each jaw element has an outer side provided with a laterally projecting, axially disposed flange 90, which flange is slidably disposed in a groove 92 that is formed on the inner surface of each of the side bars 14 and 16. Thus, by virtue of the sliding relation of the flanges 90 and the grooves 92, the movable jaw assembly 80 is slidably mounted in and positioned between the side bars 14 and 16. The jaw elements 82 and 84 terminate, at their outer ends, in rearwardly and inwardly converging jaw faces 96 and 94 respectively, such faces being provided with teeth 98 and being formed complementary to the faces of the fixed jaw sections 22 and 24.

The movement of the movable jaw structure 80 toward the fixed jaw sections 22 and 24 is resisted by a spring means 100, such spring means acting on each of the jaw elements or members 82 and 84 and being operative, upon the venting of the air cylinder to the atmosphere, to move the jaw members rearwardly away from the fixed jaw sections. Such spring means includes coil springs 102 and 104, which are housed in the grooves 92 and which bear at one end against shoulders 106, formed at the outer ends of the fixed jaw sections 22 and 24. The opposite ends of the springs are seated in wells 109 formed in the jaw members and bear against shoulders 110.

A valve means 112 is provided for venting the air cylinder 28 to the atmosphere, so as to release the air pressure therein and permit the movable jaw assembly to be moved away from the fixed jaw faces for the release of the workpiece. Such valve means 112 includes a valve 114, which is seated in a valve seat 116 that is formed in the inner end of a bore 118, the bore being provided in a radial enlargement 120 on the outer or free side of the air cylinder and being radially communicated with the interior of the air cylinder. The valve stem 122 is

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slidably disposed in the bore 118 and through an opening 124 formed in the side bar 14. The valve stem terminates at its outer end in a disc 126 which forms a finger button for depressing or sliding the valve stem inwardly. A shoulder 128 is provided on the valve stem, complementary to the outer end of the enlargement and a coil spring 130 bears against the shoulder and seats on the outer end of the enlargement, so as to normally maintain the valve member 114 in a closed position in the valve seat 116.

In use, a conventional air hose is attached to the connection 50 of the fitting and air is admitted into the air cylinder, until the movable jaw assembly 80 is moved relative to the fixed jaw sections so as to firmly and securely grip on a work piece. At this point, the air hose may be detached or it may be left attached, as may be desired.

When it is desired to release the work piece, the valve 114 is opened by pressing the valve stem 122 inwardly, which action requires but a slight finger pressure on the button 126. The air cylinder is then vented to the atmosphere and the springs, which have been compressed and tensioned by the forward movement of the jaw assembly 80, are then free to urge such assembly rearwardly or away from the fixed jaw sections.

It is to be particularly noted that the movable jaw assembly 80 can be moved relative to the fixed jaw sections so as to clampingly engage any type or size of work piece. In this respect, the particular configuration and formation of the outer ends of the movable jaw members 82 and 84 and the faces of the fixed jaw sections are merely exemplary, since the working faces of the movable jaw members and the faces of the fixed jaw sections may be formed so as to clamp any type of work piece, irrespective of its cross-sectional shape or configuration.

With the cover plate 34 in place and being held by the fasteners 35, as shown in Figure 4, it can be seen that a very compact tool is provided, with the outer end portions of the side bars 14 and 16 and the side 32 and cover plate cooperating to form a convenient handle means, whereby the tool may be manipulated and used to advantage in any position.

While the wrench 10 of Figures 1-5 is shown as being of the boxed or closed type, the present invention comprehends the provision of any type of wrench or plier assembly. Thus, attention is directed to the showing in Figures 6 and 7, wherein the wrench 10a includes the side bars 16a and 14a and the cylinder 28a.

The side bars 14a and 16a are connected at their rearward ends by a transverse end wall 132 and are connected at their front ends by a transverse end wall 134. A head assembly 136 is disposed forwardly of the end wall 134, with the side bars 14a and 16a, intermediate the end walls defining a handle means.

The head assembly 136 includes parallel side bars 138 and 140, which constitute integral prolongations of the side bars 14a and 16a and which are connected by a side 142. A cover plate 144 is provided to constitute the opposing side and is formed with openings to receive fasteners 146, which are threaded into suitable openings 148. The outer end of the side bar 138 is formed with an integral fixed jaw member 150, which has a convex outer face 152 and a flat inner jaw face 154, which may be suitably serrated or toothed. The jaw face 154 is disposed at an acute angle to the axis of the handle means and is disposed rearwardly, facing towards the handle means. The fixed jaw members 150 also includes an offset block 156, which is integral with the side bar 140 and connects the fixed jaw with the side bar 140 and which is also formed integral with the side 142. The rear edge 158 of such block defines a shoulder against which the front edge of the cover plate 144 abuts, as shown in Figure 6.

The block 156 is formed with an axial groove 160, which opens through the outer side 162 thereof. An axial bore 164 is formed in the groove and is aligned

with a threaded bore 166 in the fixed jaw and also is aligned with an opening 168 formed through the end of of the block, contiguous with the side bar 140. A guide bar 170 is fitted in the bore and is provided with a head 172, that is suitably formed, as with a threaded end 174, so as to be fitted by a tool, as a screw driver, into the bore, with the rod having an inner, coaxially reduced, threaded end 174, which is threaded into the threaded bore 166.

The rod 170 and the groove 160 cooperate to provide a guide means for a movable jaw 176, the movable jaw having a bore 178, which receives the guide rod and the bore being formed in a reduced tail portion 180 of the jaw.

The tail portion extends inwardly, beyond the groove, and lies between the side 142 and the cover plate 144. The inner end 182 of the tail portion is formed with a socket 184 to receive a ball 186, which is formed on the distal end of a crank arm 188. The crank 190 is pivoted, intermediate its ends, on a pivot pin 192, which extends between the side 142 and the cover plate. The other, curved end 194 of the crank is attached to the piston rod 196.

In this respect, the piston rod 196 is sealingly and slidably extended through an opening 198 formed in the wall 134 and terminates in a threaded stud 200, which has a coupling or connecting member 202 attached thereto. The coupling or connector member 202 is provided with a ring 204, within which the free end 206 of the arm is fitted, so that the crank is secured to the outer end of the piston rod. It is to be noted that the inner surface of the ring is convex and is engaged by the concave surface of the curved arm 194, so as to permit a relative sliding movement, with the arm 194 sliding within the ring, as the piston rod moves rectilinearly and the rectilinear movement of the piston rod is translated by the crank arm into a sliding motion of the movable jaw in the groove 160 and on the guide rod 170 toward and away from the fixed jaw 150.

A piston 208 carries the piston rod and is workably disposed in the cylinder 28a. The outer, internally threaded end 210 of the cylinder is closed off by a plug 212, which is provided with a conventional needle valve 214, the needle valve permitting the interior of the cylinder to be vented to the atmosphere, as will be described.

A passage 216 is formed alongside the free wall of the cylinder and is communicated with the cylinder, adjacent its closing ends, by means of ports 218 and 220, which ports are tapered to provide valve seats for valves 222 and 224. The valves 222 and 224 are similarly constructed and operated and, with regard to the valve 224, such valve assembly 226 includes a valve stem 228, which is slidably disposed, transversely of the passage, and through a plug 230, that is threaded into an opening in the outer wall of the passage. A rocker arm 230 has one end fitted in an opening 232 in the outer end of the valve stem and has its opposing end engaged by a spring 234. The rocker arm is pivoted, intermediate its ends, as at 236 and the spring, which is seated in a socket 238 in the outer wall of the passage and which bears against the underside of the adjacent end of the rocker arm serves to urge the valve stem inwardly so as to seat the valve in the valve seat. A plug 240 is threaded through the side bar 14a and slidably supports a stem 242, which has a button 244 provided on its outer end and which has an enlarged inner end 246 that bears against the rocker arm, the stem 242 and the spring 234 being in axial alignment. The button 244 is disposed exteriorly of the side bar 14a and, by manually depressing the button, the rocker arm is swung about its pivot 236 to slide the valve stem outwardly and move the valve 224 out of its valve seat 218. The valve assembly 226a is similarly constructed and operated.

The fitting 38a, which is engaged with threads 38b formed in the outer, counterbored end 248 of the passage

216 is similar to the fitting 38 and has the outer connector end 50a to receive the air hose A.

When the air hose is operative to discharge compressed air to the passage 216, the movement of the piston 208 and, consequently, movement of the movable jaw 176 relative to the fixed jaw, it is controlled by the selected operation of the valves 226 and 226a. With the valve of the valve assembly 226 being closed and with the valve 222 of the valve assembly 226a being open, it can be seen that the compressed air from the passage 216 will enter the forward end of the cylinder and will act on the forward face of the piston 208 to move the piston rod 196 rearwardly, thereby swinging the crank 190 rearwardly and moving the movable jaw on the guide rod 170 away from the fixed jaw.

To move the movable jaw toward the fixed jaw, as in gripping a work piece between the jaws, the valve 224 is unseated, by manually depressing the button 244, which acts through the rocker arm to lift the valve from its rivet seat. The valve 222 of the valve assembly 226a is maintained closed by its spring, with no pressure being applied to the button of the valve assembly. Thus, the compressed air entering the passage 216 passes through the bore 218 into the rearward end of the cylinder. The pressure in the forward end of the cylinder is dissipated, due to the fact that the opening 198 is larger in diameter than the diameter of the piston rod 196. This permits the air in the forward end of the cylinder to be vented to the atmosphere through the opening 198.

The valve 224 is maintained open, until the movable jaw reaches the desired position, relative to the fixed jaw, and the work piece is securely clamped between the jaws. At this point, the air hose A may be disconnected or may be allowed to remain attached to the fitting, similar to the use of the tool, disclosed in Figures 1-5.

To release the work piece, by moving the movable jaw away from the fixed jaw, the valve 222 is opened, after rotating the stem of the bleeder valve 214 so as to vent the rearward end of the cylinder to the atmosphere. The compressed air, entering through the port 220 and acting on the forward face of the piston moves the piston rearwardly in the cylinder, with the air in the rearward portion of the cylinder being forced through the bleeder valve 214.

As shown in Figures 8-10, it is contemplated by the present invention to convert the wrench of Figures 6 and 7 into a socket wrench, which would be useful, in place of conventional socket wrenches. As is known, it is necessary to store and employ a large number of socket wrenches, with the sockets varying in sizes. It is proposed that attachments may be secured or fitted to the fixed and movable jaw members, whereby the wrench can be employed as a socket wrench and that the attachments will be of such a nature that the pair of such attachments will cover a wide range of socket wrench sizes.

As shown in Figures 8 and 9, the side faces 250 and 252 of the jaw members are formed, adjacent their confronting jaw faces, with indentations 254. The socket wrench attachment 256, includes companion sections 258 and 260, which are identically constructed. The attachment section 258 includes a body portion 262, which has a flat outer side that confronts the face of the jaw 176 and is disposed in facial contact therewith. An axial channel 264 is formed in the inner face of the body portion. The upper end of the body portion 262 is provided with a lateral flange 266, which overlies the face 252 of the jaw member 176 and which is formed with a prolongation of the channel 264 at the center of its inner side. The flange is formed centrally and on its underside with a socket 268, within which a spring urged detent 270 is housed, the detent being urged by the spring into the indentation 254 so as to lock the attachment 258 onto the jaw 176.

The body portion 264 is formed at its lower end with a lateral flange 272, which is disposed parallel with the

flange 266, the flanges cooperating to provide a channel which receives the jaw 176, with the underside of the flange 266 engaging the side 252 of the jaw and the upper side of the flange 272 engaging the opposing side of the jaw. The flange 272 is provided at its perimeter with a depending skirt portion 274, which has its inner surface 276 formed with a series of contiguous, angular faces 278.

As shown in Figure 9, the socket wrench attachments 258 and 260 are secured on the jaws 150 and 176, as described in connection with the one section 258. Thus, the channels 264 are disposed in confronting relation, while the inner faces of the skirt portions 274 are also disposed in confronting relation, the faces, as shown in Figures 9 and 10, being in opposing and complementary relation so as to define a plurality of sockets. The shape of the socket wrench, which may be constituted by the attachments, in any given position of the jaws, can be determined by the particular use of opposing or companion sets of faces 278 on the complementary skirt portions, while the size thereof can be adjusted by adjusting the movable jaw 176, relative to the fixed jaw 150, as afore-described.

While the preferred embodiments of the present invention have been described and illustrated herein, other forms may be realized, as come within the spirit and scope of the appended claims.

What is claimed is:

1. In a fluid operated tool, an elongated open body portion having opposing end walls and opposing side walls, one of said end walls defining a fixed jaw and having a jaw face on its inner surface, the other end wall and the adjoining portions of the side walls defining a handle, a cylinder formed integrally with the inner surface of one side wall and extending from the other end wall to a point spaced from the fixed jaw, said cylinder having an end wall spaced from the fixed jaw, a piston working in the cylinder and having a piston rod slidable through the end wall, a crank type lever having a long first arm and a short second arm, said lever being pivoted intermediate its arms to the other side wall, means connecting the piston rod to the first lever arm, a movable jaw assembly, means mounting the movable jaw assembly for movement relative to the fixed jaw, said second lever arm being engaged with the movable jaw assembly for moving the movable jaw assembly toward the fixed jaw, means provided at the other end wall of the body portion for connecting an air hose in communication with the interior of the cylinder, and valve means operatively mounted in the body portion in communication with the cylinder to vent the cylinder to the atmosphere.

2. In a fluid operated tool, an elongated open body portion having opposing end walls and opposing side walls, one of said end walls defining a fixed jaw and having a jaw face on its inner surface, the other end wall and the adjoining portions of the side walls defining a handle, a cylinder formed integrally with the inner surface of one side wall and extending from the other end wall to a point spaced from the fixed jaw, said cylinder having an end wall spaced from the fixed jaw, a piston working in the cylinder and having a piston rod slidable through the end wall, a crank type lever having a long first arm and a short second arm, said lever being pivoted intermediate its arms to the other side wall, means connecting the piston to the first lever arm, a movable jaw assembly, means mounting the movable jaw assembly for movement relative to the fixed jaw, said second lever arm being engaged with the movable jaw assembly for moving the movable jaw assembly toward the fixed jaw, means provided at the other end wall of the body portion for connecting an air hose in communication with the interior of the cylinder, valve means operatively mounted in the body portion in communication with the cylinder to vent the cylinder to the atmosphere, and spring means mounted in the side walls between the fixed

jaw and the movable jaw assembly for moving the movable jaw assembly away from the fixed jaw when the cylinder is vented by the valve means to the atmosphere.

3. In a fluid operated tool, an elongated open body portion having opposing end walls and opposing side walls, one of said end walls defining a fixed jaw and having a jaw face on its inner surface, the other end wall and the adjoining portions of the side walls defining a handle, a cylinder formed integrally with the inner surface of one side wall and extending from the other end wall to a point spaced from the fixed jaw, said cylinder having an end wall spaced from the fixed jaw, a piston working in the cylinder and having a piston rod slidable through the end wall, a crank type lever having a long first arm and a short second arm, said lever being pivoted intermediate its arms to the other side wall, means connecting the piston rod to the first lever arm, a movable jaw assembly, means mounting the movable jaw assembly for movement relative to the fixed jaw, said second lever arm being engaged with the movable jaw assembly for moving the movable jaw assembly toward the fixed jaw, means provided at the other end wall of the body portion for connecting an air hose in communication with the interior of the cylinder, valve means operatively mounted in the body portion in communication with the cylinder to vent the cylinder to the atmosphere, and guide means for the movable jaw assembly for moving the movable jaw assembly in a rectilinear path of movement toward and away from the fixed jaw.

4. In a fluid operated tool, an elongated open body portion having opposing end walls and opposing side walls, one of said end walls defining a fixed jaw and having a jaw face on its inner surface, the other end wall and the adjoining portions of the side walls defining a handle, a cylinder formed integrally with the inner surface of one side wall and extending from the other end wall to a point spaced from the fixed jaw, said cylinder having an end wall spaced from the fixed jaw, a piston working in the cylinder and having a piston rod slidable through the end wall, a crank type lever having a long first arm and a short second arm, said lever being pivoted intermediate its arms to the other side wall, means connecting the piston rod to the first lever arm, a movable jaw assembly, means mounting the movable jaw assembly for movement relative to the fixed jaw, said second lever arm being engaged with the movable jaw assembly for moving the movable jaw assembly toward the fixed jaw, means provided at the other end wall of the body portion for connecting an air hose in communication with the interior of the cylinder, valve means operatively mounted in the body portion in communication with the cylinder to vent the cylinder to the atmosphere, and means for moving the movable jaw assembly away from the fixed jaw when the cylinder is vented to the atmosphere, said last means including a fixed connection between the second lever arm and the movable jaw assembly, and valve means for admitting air to the cylinder on the opposite side of the piston.

5. In a fluid operated tool, an elongated open body portion having opposing end walls and opposing side walls, one of said end walls defining a fixed jaw and having a jaw face on its inner surface, the other end wall and the adjoining portions of the side walls defining a handle, a cylinder formed integrally with the inner surface of one side wall and extending from the other end wall to a point spaced from the fixed jaw, said cylinder having an end wall spaced from the fixed jaw, a piston working in the cylinder and having a piston rod slidable through the end wall, a crank type lever having a long first arm and a short second arm, said lever being pivoted intermediate its arms to the other side wall, means connecting the piston rod to the first lever arm, a movable jaw assembly, means mounting the movable jaw assembly for movement relative to the fixed jaw, said second lever arm being engaged with the movable jaw assembly for moving the movable jaw assembly toward the fixed jaw, means provided

at the other end wall of the body portion for connecting an air hose in communication with the interior of the cylinder, valve means operatively mounted in the body portion in communication with the cylinder to vent the cylinder to the atmosphere, and socket wrench forming adapters fitted on the fixed jaw and the movable jaw assembly so as to overlie the faces thereof.

6. In a fluid operated tool, an elongated open body portion having opposing end walls and opposing side walls, one of said end walls defining a fixed jaw and having a jaw face on its inner surface, the other end wall and the adjoining portions of the side walls defining a handle, a cylinder formed integrally with the inner surface of one side wall and extending from the other end wall to a point spaced from the fixed jaw, said cylinder having an end wall spaced from the fixed jaw, a piston working in the cylinder and having a piston rod slidable through the end wall, a crank type lever having a long first arm and a short second arm, said lever being pivoted intermediate its arms to the other side wall, means connecting the piston rod to the first lever arm, a movable jaw assembly, means mounting the movable jaw assembly for movement relative to the fixed jaw, said second lever arm being engaged with

the movable jaw assembly for moving the movable jaw assembly toward the fixed jaw, means provided at the other end wall of the body portion for connecting an air hose in communication with the interior of the cylinder, valve means operatively mounted in the body portion in communication with the cylinder to vent the cylinder to the atmosphere, socket wrench forming adapters fitted on the fixed jaw and the movable jaw assembly so as to overlie the faces thereof, and releasable locking means connecting the adapters to the fixed jaw and the movable jaw assembly.

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