Oct. 13, 1931. R. H. MINER 1,827,159

AIR WRENCH

Filed May 29, 1930

Fig. 1.

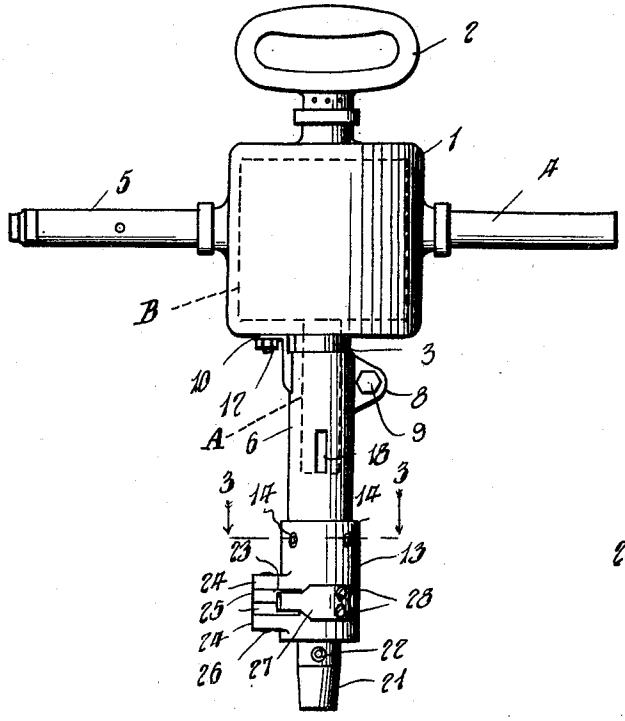


Fig. 2.

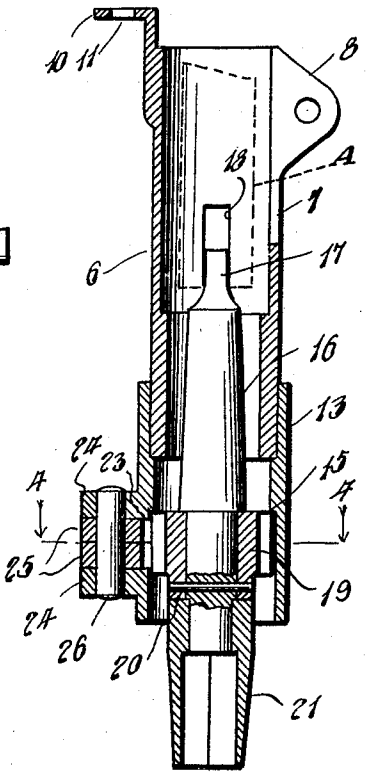


Fig. 3.

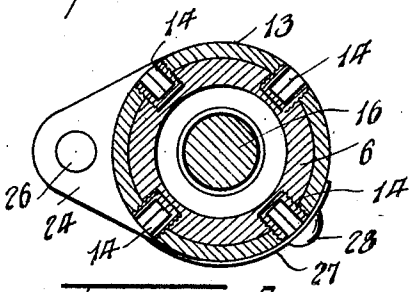


Fig. 4.

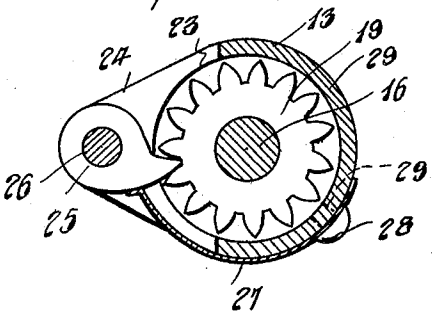
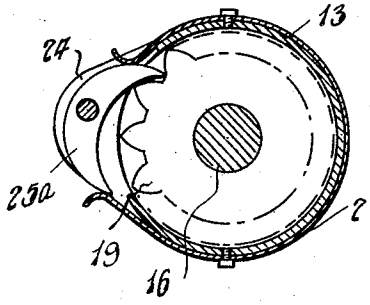


Fig. 5.



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Patented Oct. 13, 1931 1,827,159

UNITED STATES PATENT OFFICE

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AIR WRENCH

Application filed May 29, 1930. Serial No. 457,163.

The invention relates to air wrenches, and has for its principal object the provision of improvements in air wrenches by which the operation of air wrenches is made safe for the operator, and an air wrench may be used for turning on and off nuts and cap screws by using air motors of lower power than has heretofore been used for the same size work, thus reducing the cost of the tool and the air pressure required for operation of the tool.

In the use of air wrenches as at present constructed it has been found that the air wrench cannot be utilized for turning down the nut or cap screw to a set position, nor can the air wrench be utilized for starting the nut or cap screw from a set position, because the torsion created by the motor renders it impossible for the operator to hold the tool in position, and the tool is liable to get away from the operator with more or less serious consequences.

Heretofore, it has been the practice in using air wrenches to employ a hand operated wrench for finally setting the nut or cap screw, and for loosening the nut or cap screw from a set position before applying the wrench, thus making two operations necessary, one the hand operation, and the other by means of the air tool.

This invention has for its object the provision of an attachment for air wrenches by which the same tool may be used for operation by hand, and also by air so that the hand operation may immediately precede or follow operation by the air motor without removal of the tool from position, thus saving time in operation of screwing and unscrewing nuts and cap screws.

The invention will be described in detail hereinafter and will be found illustrated in the accompanying drawings in which

Figure 1 is a view in elevation of an air wrench with the improvements applied thereto,

Figure 2 is a longitudinal sectional view of the wrench attachment,

Figure 3 is a transverse sectional view on a plane indicated by the line 3—3 of Figure 1,

Figure 4 is a similar view on a plane indicated by the line 4—4 of Figure 2, and

Figure 5 is a view similar to Figure 4 showing a slight modification of the device.

In the drawings similar reference characters are used to designate corresponding parts in all of the views.

In Figure 1 the improvements are shown applied to an air or pneumatic wrench of the type manufactured by Wm. H. Keller Inc. of Grand Haven, Michigan, but, except for minor changes, may be applied to other types of air or pneumatic tools of other manufacturers. The motor casing, designated 1, is provided with the usual handle 2 for manipulating the tool, and has a tubular extension 3 through which the motor shaft A protrudes from the casing 1. The motor in the casing 1 is indicated at B.

The invention relates to that type of pneumatic motor operated wrenches having radially extending arms 4 and 5, the arm 5 being adapted to form the nozzle for attachment of the air hose, said arms being adapted to be utilized also for manually turning the tool as will be more clearly brought out hereinafter.

Mounted on the tubular member 3 is a tubular housing 6, said housing being split longitudinally from the end engaging the tubular member 3 as shown at 7, and provided with laterally extending flanges 8 to receive a bolt 9 to clamp the housing on the tubular member 3. The tubular housing 6 is also provided with a laterally extending ear 10 having an opening 11 to receive a threaded stud 12 on the casing 1, and to be secured to the casing by means of a nut on said stud as shown in Figure 1, this structure providing for a rigid connection between the housing 6 and the motor casing 1. The tubular housing 6 includes a sleeve 13 secured thereto by set screws 14 or in any other suitable manner, and sleeve 13 is provided with an annular interior shoulder 15. Mounted in the tubular housing for rotatable movement is a wrench member 16 including a stem having a reduced and flat portion 17 to engage the end of the motor shaft (not shown), 18 indicating a sight opening in the housing 6 to enable the operator to readily assemble the clutch member in the end of the shaft.

Wrench member 16 also includes a ratchet member 19 that is secured to the stem of the member by means of a transverse pin 20 or by any other suitable means, 21 indicating a wrench bit secured to the end of the stem of the member by means of a set screw 22 or other suitable means. When the wrench member 16 is in position in the tubular housing, the ratchet 19 limits the inward movement of the member by engaging the shoulder 15, and said ratchet member provides a bearing for the wrench member during operation, it being apparent that the wrench member may be readily removed through the outer end of the tubular member 6 when desired in order to change the size of the wrench for the operation to be accomplished.

The sleeve 13 opposite the ratchet 19 is slotted as shown at 23 and provided with outwardly extending ears 24 defining the side walls of said slotted opening 23, and 25 designates pawls pivoted on a pin 26 extended through said ears 24 and pawls 25 and cooperating with the ratchet 19. 27 indicates a leaf spring secured to the sleeve 13 by means of driven fastenings 28 and engaging the pawls 25 to hold them in engagement with the ratchet 19. The sleeve 13 is provided with threaded openings 29 at the opposite side thereof as shown in Figure 4, so that the attachment may be utilized for turning up or unscrewing a nut or cap screw as may be desired by removing the screws 28 from one set of openings, removing the pin 26 and reversing the pawls and reversing the position of the spring.

In Figure 5 is shown a slightly modified construction in which instead of having reversible pawls 25 a double pawl or pawls 25^a is substituted, and the spring 27^a extends around the sleeve 13 and has its two ends engaged with the opposite ends of the pawl, this construction making it unnecessary to remove the pawls and spring and reverse their positions as above described in connection with the other figures of the drawings.

In using the tool for turning on nuts and cap screws the air motor will be used until the nut or cap screw is nearly set when the air will be turned off and the remainder of the operation will be accomplished by hand, using the arms 4 and 5 to turn the tool and the ratchet structure 19 and pawls 25 permitting the tool to be conveniently used for this purpose by turning it back and forth until the nut or cap screw is completely set. In unscrewing a nut or cap screw it will be apparent that the operation will be reversed, as the nut or cap screw will first be unseated by hand, and the completion of the turning of the nut or cap screw will be accomplished quickly by means of the air motor.

What is claimed is:—

1. In an air wrench including a motor and casing, the motor having a shaft, a tubular member on said casing surrounding the shaft, a tubular housing adapted to be secured to said tubular member, a wrench member rotatable in said housing, said wrench member including a stem arranged axially of and adapted to engage said shaft, an annular ratchet secured to said wrench member, and a pawl mounted on said housing and cooperating with said ratchet.

2. In an air wrench including a motor and casing, the motor having a shaft, a tubular member on said casing and surrounding the shaft, radially extending arms secured to said casing, a tubular housing adapted to be secured to said tubular member, a wrench member rotatable in said housing and adapted to engage said shaft, an annular ratchet secured to said wrench member, and a pawl mounted on said housing and cooperating with said ratchet.

3. In an air wrench including a motor and casing, the motor having a shaft, a tubular member on said casing surrounding the shaft, radially extending arms secured to said casing, a tubular housing adapted to be secured to said tubular member, the housing being split longitudinally where engaging said tubular member, and having a lateral ear on its engaging end, means to clamp said split portion on said tubular member, means on the motor casing engaging said ear to hold the housing from displacement on the member, a wrench member rotatable in said housing and adapted to engage said shaft, an annular ratchet secured to said wrench member, and a pawl mounted on the housing and cooperating with said ratchet.

In testimony whereof I affix my signature.

ROY H. MINER.