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A. H. MOORE

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VALVE TURNING TOOL

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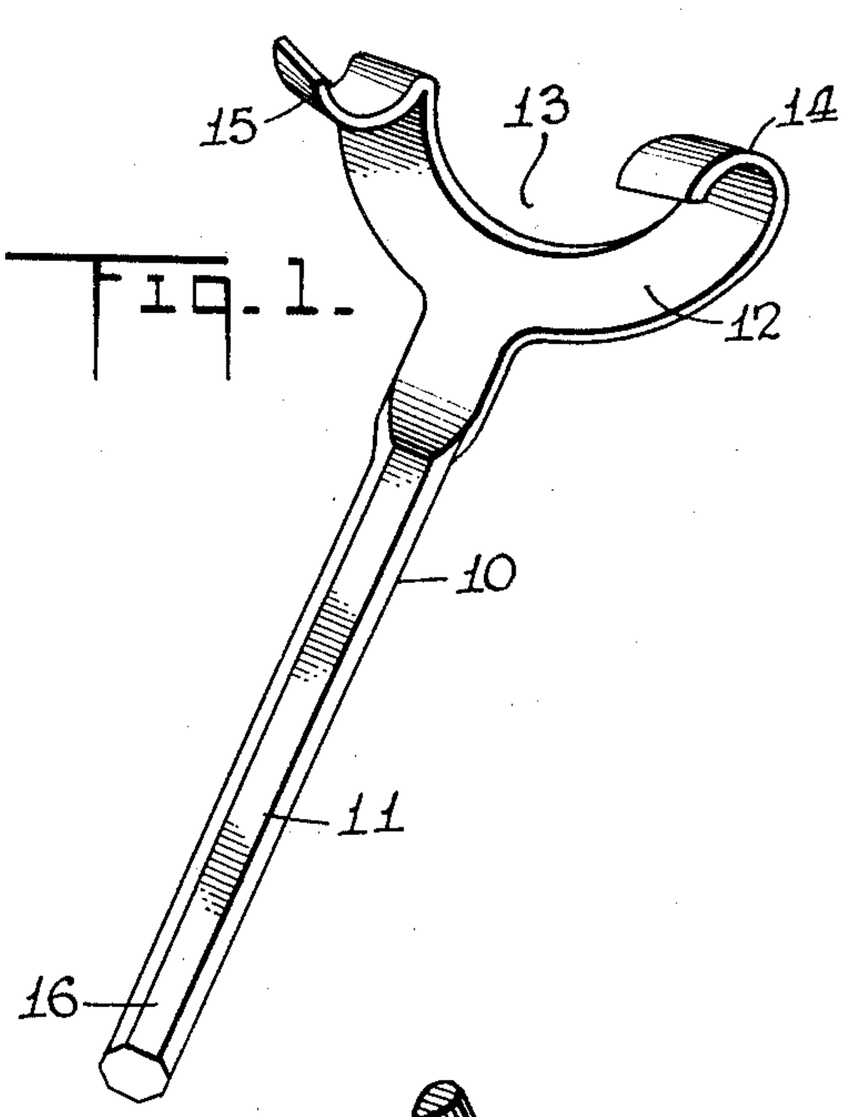

Fig. 1.

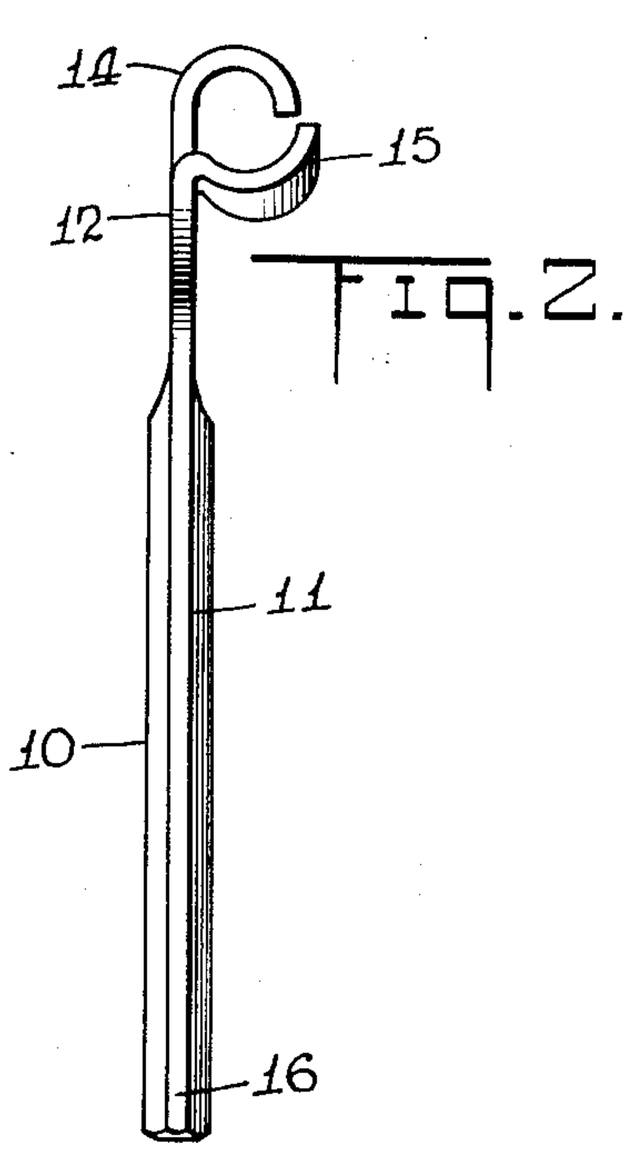

Fig. 2.

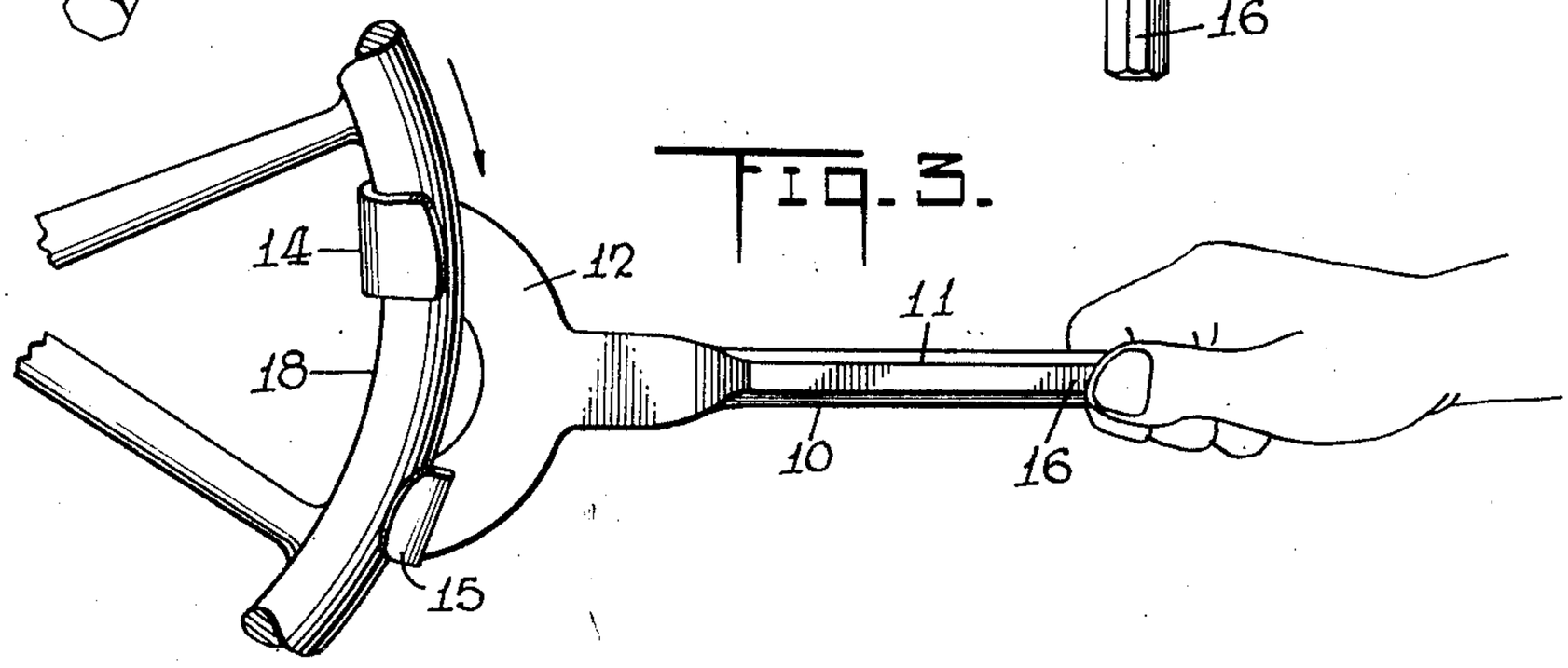

Fig. 3.

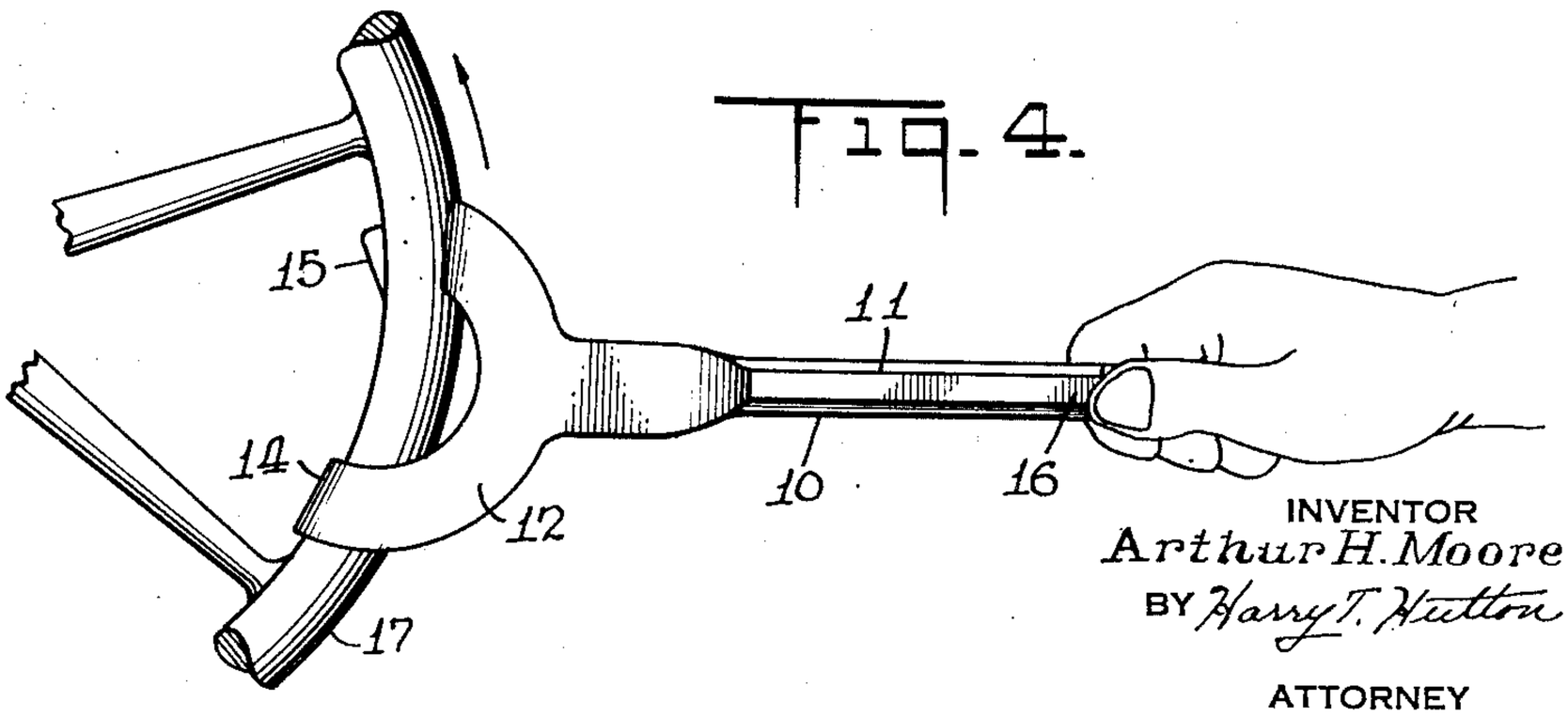

Fig. 4.

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VALVE TURNING TOOL

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3 Claims. (Cl. 81—90)

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The present invention relates to a wrench-type tool and more particularly, to a wrench-type tool adapted for turning valve wheels.

The valve wheels for which use of this tool is particularly intended are the widely employed types of wheels generally comprising a substantially circular outer rim connected by means, such as spokes, to a hub which when the wheel is rotated, functions either to open or close a valve. As is known to those skilled in the art, considerable force must oftentimes be employed to tightly close valves to prevent leakages therethrough and, similarly, to open tightly closed valves. Common practice is to use means, such as wrenches, rods, and the like, to engage the hub, spokes and/or rim of the valve wheel in order to apply sufficient force to rotate the wheel, and by using commonly employed means, breakage of the wheel rim, or spokes and the like often occurs necessitating replacement of the valve wheel.

One object of the present invention is to provide a tool of such construction that it can effectively be employed for turning valve wheels with decreased tendency for breakage of said wheels.

Another object of the invention is to provide a tool of the wrench type having hook-like members so formed that they may be firmly engaged with the rim of a valve wheel and not likely to slip out of engagement with said rim when force is applied to the tool for the purpose of rotating the valve wheel.

Still another object of the present invention is to provide a tool which is very strong, easy to operate, and not likely to break when considerable force is applied thereto for rotating valve wheels.

The present invention also embodies as another object the provision of a tool of the wrench-type having hook-like members formed so that they may be engaged with the substantially circular outer rim of a valve wheel whereby considerable rotative force may be applied to the wheel with greatly reduced tendency for the wheel to break as a result of the force applied thereto.

The invention is illustrated in the accompanying drawings in which like reference numbers have the same signficance, setting forth preferred embodiments of the invention.

Figure 1 is a perspective view of a tool such as provided by the present invention;

Figure 2 is another perspective view of the tool shown in Figure 1, further illustrating the

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disposition of the hook-like members of the novel tool;

Figure 3 is a perspective view of the tool, such as shown in Figure 1, illustrating a manner of engaging the tool with a valve wheel to provide for clockwise turning of valve wheels; and

Figure 4 is a perspective view of the improved tool illustrating the manner of engagement of said tool with a valve wheel to provide for counter-clockwise rotating of valve wheels when employing a tool such as illustrated in Figure 1.

Broadly speaking, the novel tool of the present invention is a lever device for rotating valve wheels and comprises a handle member and a bifurcated end member integral therewith and a substantially semi-circular end portion on each leg of said bifurcated member adapted to engage substantially opposite surfaces of the rim of a valve wheel. The bifurcated end member, integral with the handle member, is preferably of U-shape and provides an effective means for rotating valve wheels when the tool is engaged with the valve wheel, in a manner such as hereinafter described, and force is applied to the handle member.

In order to illustrate my invention, reference is made to the drawing of Figure 1, illustrating an embodiment of the novel tool provided herein. As shown in Figure 1, the improved tool is of the wrench type and consists of a bar 10 of tool steel, or other suitable material of convenient length for handling and whose dimensions in cross section are sufficient to withstand the uses to which the tool would ordinarily be put. Handle 11 of bar 10 is preferably of polygonal design, such as octagonal, to provide for sufficient gripping of the handle, such as at end 16 of handle 11, to minimize the tendency for slippage when means, e. g., such as by hand, are employed for applying force to the tool when in use for rotating valve wheels. In a preferred embodiment of the present invention, one end of bar 10 is flattened and widened on opposed surfaces, such as at handle portion 12, integral with a substantially U-shaped, e. g., bifurcated member 13 having substantially semi-circular legs 14 and 15 adapted for engaging circumferentially remote and substantially opposite surfaces of the rim of a valve wheel. As shown in Figure 1, one leg of said U-shaped member, such as represented by reference character 14, is upset at the end of the U-shaped member 13 for engaging a portion of the inner surface of the rim of a valve wheel and the other leg, i. e., leg 15, is substantially oppositely upset to provide for en-

gaging a portion of the outer surface of the rim of said wheel. Figure 2 is another view of the novel tool, as shown in Figure 1, further illustrating a suitable manner in which the hook-like members are disposed, and in the specific embodiment shown, rim-engaging members 14 and 15 have angular rim-engaging leading edges and axes of curvature converging toward each other. By engaging the tool with the rim of a valve wheel, in a manner such as described more fully hereinafter, force may be applied to handle member 11, such as at end 16 thereof, whereby leverage is applied to the U-shaped member providing for rotating of the wheel engaged by legs 14 and 15.

In application of the novel tool for rotating valve wheels, legs 14 and 15 are engaged with the rim of a valve wheel as shown in Figure 4 illustrating the use of the tool shown in Figure 1 for turning the wheel in a counter-clockwise direction. As illustrated in Figure 4, the tool 10 is engaged with wheel rim 17 by placing hook-like member 14 around an inner surface portion of rim 17 and hook-like member 15 around an outer surface portion of rim 17, both hook-like members preferably engaging rim 17 in a substantially close-fitting contact. Through the leverage afforded by the length of the tool when force is applied to the handle portion 16 of tool 10, the tool provides an effective means for rotating the valve wheel.

Whereas Figure 4 illustrates a manner for using the novel tool of Figure 1 for counter-clockwise turning of a valve wheel, Figure 3 illustrates a manner of engaging the rim of a valve wheel with a substantially similar tool to turn the wheel in a clockwise direction. For such a purpose, tool 10 of Figure 3 is engaged, as shown, with rim 18 in a manner whereby hook-like members 14 and 15 are placed around portions of rim 18, the hook-like members engaging substantially circumferentially remote and oppositely disposed surface portions of the wheel rim and, preferably, in substantially close-fitting contact with said rim surfaces.

With reference to hook-like members 14 and 15 of the U-shaped member of the novel tool, it has been stated hereinbefore that the function of these hook-like members is to engage substantially opposite surfaces of a wheel rim, to provide leverage for rotating the wheel when force is applied to the handle portion of the tool. Satisfactory results, in turning valve wheels employing the novel tool of the present invention, are provided when the engaging portions of each of the hook-like members are wholly or partly engaged with the aforesaid surfaces of the wheel rim. However, in order to provide optimum results for rotating valve wheels, it is preferable that the angular leading edges of the hook-like members engage the wheel rim in substantially close-fitting contact and hence, the inner-curved surfaces of each of the substantially semi-circular hook-like members 14 and 15 should be so formed as to be similar in curvature to the portion of the rim surfaces that is to be engaged by each of said hook-like members. By disposing the hook-like members in a manner to provide for substantially close-fitting engagement with the rim surface, considerable force may be applied to the tool with highly satisfactory results in rotating valve wheels with considerably decreased tendency, as compared with previously employed methods, for breakage of the wheel.

In the foregoing description of the application of my novel tool for use in rotating valve wheels, it has been set forth that hook-like members 14 and 15 are engaged with substantially oppositely disposed portions of the wheel rim. In order to provide an efficient means for thus engaging the wheel rim, such as wherein one hook-like member engages the outer surface and the other hook-like member engages the inner surface of the wheel rim, the novel tool contains a bifurcated portion as shown by bifurcation 13 of Figure 1. In engaging the novel tool with the wheel rim on which it is to be employed, the tool is manipulated so that the space between the hook-like members 14 and 15 provides clearance for the rim and the tool is then twisted to engage the hook-like members with the rim. Hence, in order that proper clearance of the wheel rim is provided, the hook-like members are disposed so that the space between the hook-like members provides clearance for the rim on which the tool is employed. Thus, for example, when employing the novel tool on a substantially circular rim, such as may be illustrated by Figure 4, the distance between hook-like members 14 and 15 should be greater than the diameter of a transverse section through rim 17 whereby proper clearance of the rim is provided for efficiently engaging the tool with the wheel rim.

Although the present invention has been described in conjunction with certain preferred embodiments thereof, it is obvious to those skilled in the art that the construction and arrangements of parts of the tool may be varied without departing from the spirit of my invention. Such variations and modifications are to be considered to be within the purview of the specification and the scope of the appended claims. Thus, although the present invention has been described in connection with the drawings herein illustrating my novel tool as an integral unit, such as may be provided by welding together certain parts thereof, it is within the scope of the present invention to include similar tools formed by attaching together parts thereof in a manner whereby replacement of the hook-like members can easily be made. For example, it is considered within the scope of the present invention to include a tool similar in construction and arrangement of parts thereof as illustrated in Figure 1, but in which tool the handle portion and hook-like members are attached together in a manner, other than to provide an integral unit, e. g., such as obtained by welding, whereby the hook-like members can be changed as desired to provide a tool that is adaptable for adjustment and use with wheel valves of a different rim size to provide for efficient engagement of the hook-like members with the specific wheel rim on which it is to be used.

I claim:

1. A valve turning tool for rotating a valve wheel by application of rotative force to the rim of said wheel comprising a leverage handle member carrying a bifurcated end portion one leg of which carries a curved leading rim-engaging member adapted to engage an outer portion of the rim and the other leg of which carries a hook-shaped trailing rim-engaging member adapted to engage a circumferentially remote inner portion of the rim, said rim-engaging members having axes of curvature converging toward each other.

2. A valve turning tool, as defined in claim 1, in which the said bifurcated end portion comprises two strips of rectangular cross-section the

terminal portions of which constitute the said rim-engaging members.

3. A valve turning tool for rotating a valve wheel by application of rotative force to the rim of said wheel comprising a leverage handle member carrying a bifurcated end portion one leg of which carries a curved leading rim-engaging member adapted to engage an outer portion of the rim and the other leg of which carries a hook-shaped trailing rim-engaging member adapted to engage a circumferentially remote inner portion of the rim, said rim-engaging members having angular rim-engaging leading edges and axes of curvature that converge toward each

other whereby localized force is exerted on the wheel rim by said edges in use of the tool.

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