Aug. 25, 1953 E. F. FISHER 2,649,825

WRENCH AND TAP DEVICE

Filed May 1, 1950

Fig-2

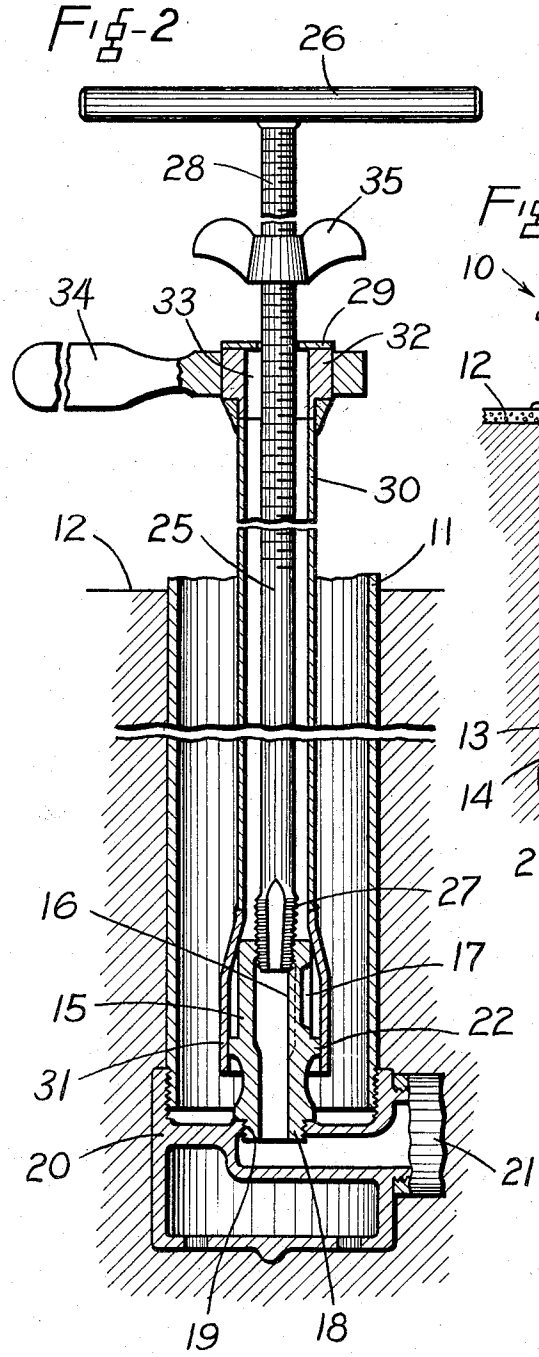


Fig-1

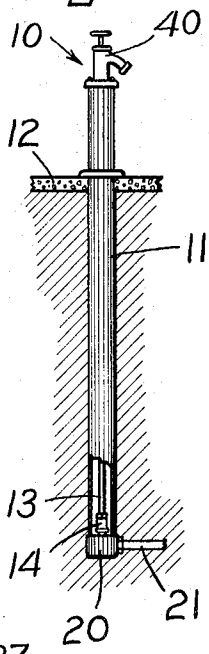


Fig-3

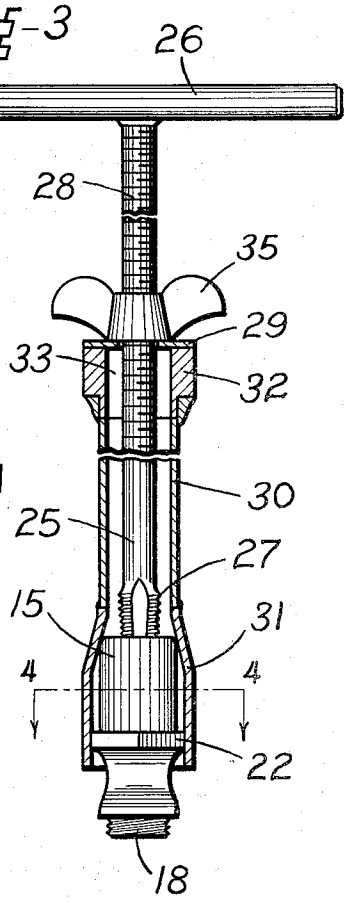
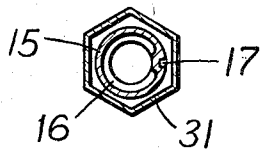


Fig-4



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Patented Aug. 25, 1953

2,649,825

UNITED STATES PATENT OFFICE

2,649,825

WRENCH AND TAP DEVICE

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Application May 1, 1950, Serial No. 159,216

7 Claims. (Cl. 81—125)

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This invention relates to combination tools and is concerned particularly with combination tools for removing and installing internal underground valve-seats or plugs of various types such as those employed in hydrants and the like which are inaccessible by the use of ordinary tools.

It is known that hydrants are secured to the upper end of a vertical pipe which extends below the street or pavement level, this vertical pipe at its lower end or shoe being connected to a main supply pipe. When the ordinary type of wrench is used to replace parts such as internal underground valve-seats in a hydrant system, it is necessary to break the pavement and remove the earth around the hydrant barrel and the vertical hydrant pipe down to the shoe or main supply pipe for the hydrant, which is ordinarily located at a considerable distance below the pavement line. It is obvious therefore that this is highly objectionable since it requires removal of a portion of the pavement and a large quantity of earth surrounding the hydrant system which must be replaced. In addition, the process of removing and installing valve-seats referred to has the disadvantage of requiring considerable time, thus materially increasing the cost of making replacements.

It is accordingly a principal object of this invention to provide a combination tool by means of which internal underground valve-seats of a hydrant system which are relatively inaccessible may be removed or installed without requiring the removal of the pavement and earth around the hydrant system.

It is another object of the invention to provide a simple and dependable combined wrench-tap device adapted to facilitate the removal of the internal underground valve mechanism of hydrants.

It is also an object of the invention to provide a tool embodying a tap and a socket wrench by the use of which a hydrant valve may be loosened and gripped at a point where it can be readily removed from the hydrant shoe.

A further object of the invention is the provision of a unitary structure of the above character which will greatly facilitate the operations outlined above and which will be compact and durable of construction.

Another object of the invention is the provision of such a device which will be efficient in operation and which can be manufactured at a relatively low cost.

The manner in which these and other objects of the invention are attained will be evident from

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the following description taken in conjunction with the accompanying drawings and the appended claims.

In the drawings—

Fig. 1 is a diagrammatic side elevation partly in section showing a typical hydrant;

Fig. 2 is a side elevation showing in detail one form of combined tap and socket member unit constructed in accordance with this invention and applied in a hydrant barrel, some portions of the unit being shown in section for clarity of illustration;

Fig. 3 is a vertical central cross-section showing a unit of this invention of the type employed in the hydrant of Fig. 2, the hydrant valve-seat being firmly held by the combined tap and socket member unit for insertion into or removal from the hydrant.

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 3.

In the several figures of the drawing, like reference numerals indicate like parts.

According to the present invention, the typical hydrant illustrated in Figs. 1 and 2 embodies a vertically positioned structure 10, having a barrel 11 which extends below the pavement or earth line 12. Within the barrel 11 is a vertically positioned pipe 13 having a valve assembly 14 at the lower end thereof including a valve-seat 15 having a flow passage wall 16, and formed with a drain or drip groove 17 and a downwardly-extending externally-threaded extension 18 screwed into an internally-threaded passage 19 in a hydrant shoe member 20 connected to the main supply line 21. The valve-seat 15 operates to prevent a fluid, as for example, water from standing in the bottom of the hydrant and freezing in winter. It frequently happens that valve-seat 15 deteriorates and becomes worn, damaged or frozen in use, necessitating its removal which heretofore has required excavation around the hydrant to a depth of approximately five or six feet, i. e. a depth sufficiently below the earth line 12 to render accessible the laterally projecting polygonal collar, as for example, hexagonal collar portion 22 of the valve-seat 15.

Such excavation is entirely eliminated with the use of the combined tool device of this invention which as illustrated in Figs. 2 and 3 comprises a longitudinal shaft or shank 25 preferably of circular cross-section provided with a handle 26 connected to the upper end thereof, this handle being in the form of a horizontal rod secured to the end of the shaft or shank 25 in any suitable manner, as for example, by welding. The lower

end of the shaft or shank 25 is provided with a thread-cutting member such as a tap 27 for engaging the upper inner portion or passage 16 of the valve-seat 15.

The shaft or shank 25 is slidably positioned within a longitudinal tubular body portion or member 30 expanded at its lower end and formed to provide a non-circular preferably polygonal socket, as for example, hexagonal socket 31 designed to engage the collar 22 of the valve-seat 15. The opposite end of the tubular body portion 30 is exteriorly provided with a square or hexagonal head or cap 32 formed with a central opening 33 through which the shaft or shank 25 is slidably extended. A hand wrench 34, as shown in Fig. 2, may be used on the head 32 for the operation of turning the tubular body member 30 to substantially loosen or disengage the externally-threaded extension 18 of the valve-seat 15, after which the internally-threaded wing-nut 35 on the threaded portion 28 of the shaft or shank 25 may be turned into locking engagement with the tubular member 30 as shown in Fig. 3 and the device can then be operated by the handle 26 to remove the valve-seat from the face of the hydrant. Preferably a lock washer 29 is provided adjacent the upper surface of the head or cap 32 to secure the above mentioned locking action of the wing-nut 35.

In operating the tool of this invention, the faucet assembly 40 is removed from the upper hydrant structure 10 and after the vertically positioned pipe 13 is withdrawn in a well known manner, the tubular member 30 and the shaft 25 are placed in the position shown in Fig. 2 with the hexagonal socket 31 in engagement with the hexagonal collar 22 and with the threaded portions of the tap 27 projecting slightly into and engaging with the upper portion of the fluid passage wall 16 of the valve-seat 15. The handle 26 is then manually turned clockwise so as to rotate the shaft 25 and thus securely engage the upper portion of the wall 16 of the valve-seat 15 with the threaded tap 27. The hand wrench 34 is then positioned about the polygonal head or cap 32 and the tubular member 30 is rotated in a direction to slightly loosen or disengage the externally-threaded extension 18 from the hydrant shoe member 20 after which the wing-nut 35 is rotated into locking engagement with the tubular member 30 and the handle 26 is then rotated to completely disengage the valve-seat 15 and remove it from the hydrant shoe 20. This operation only requires a few rotations of the tubular member 30 and the shaft 25 to draw the upper portion of the valve-seat into locking engagement with the tap 27 and to disengage the threaded portion 18 from the threaded passage 19 in the hydrant shoe member 20.

After the deteriorated valve-seat has been removed from the hydrant, a new valve-seat may be positioned in the tool of this invention as shown in Fig. 3 and properly positioned in the hydrant shoe 20 by reversing the above described operation.

There has thus been provided simple and efficient devices of the kind described and for the purposes specified.

While the articles herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise articles, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A tool of the class described comprising, a shaft having an engagement means at one end and a handle at the other end, said engagement means including a thread-cutting member to interiorly engage an underground hydrant valve assembly, a tubular body substantially encasing said shaft, a polygonal cap at one end of said tubular body having an opening slidably accommodating said shaft, said tubular body having a polygonal-socket at its other end for laterally engaging an underground hydrant valve assembly.

2. A tool for disengaging and removing an underground hydrant valve assembly through the barrel of a hydrant and the like comprising a shaft having a handle at one end and a valve-seat engaging means at the other end to interiorly engage said valve-seat, said engaging means including a thread-cutting member, a tubular body substantially enclosing said shaft, a polygonal cap at one end of said tubular body having an opening slidably accommodating said shaft, said tubular body having a polygonal socket at its other end to disengage and remove said valve assembly from said hydrant through the barrel thereof.

3. A tool comprising a threaded shaft having a handle at one end and a thread-cutting means at the other end, said thread-cutting means being engageable with an interior portion of a valve assembly screwed to the shoe of a hydrant, a body member extended about said shaft, said body member having a polygonal socket at one end to engage an exterior collar portion of said valve assembly so that said valve assembly may be unscrewed and removed from said hydrant through the barrel thereof.

4. In a wrench of the class described for disengaging and removing a hydrant valve assembly, the combination of a shaft, engagement means provided at the end of said shaft, said engagement means including a tap to engage an inner circumferential portion of said valve assembly, a slidable tubular member rotatably and longitudinally movable on said shaft, said tubular member having a polygonal socket at one end to engage a corresponding polygonal collar on said valve assembly and means at the upper end of said shaft and said tubular member whereby said shaft and said tubular member may be gripped for turning to disengage and remove said valve assembly from said hydrant.

5. A tool for removing and replacing a valve assembly from a hydrant shoe member through the barrel of a hydrant comprising a shaft having a tap formed at one end for rotatable insertion into one end of said valve assembly to exert an outward pressure against the inner wall thereof, a tubular body member movable on said shaft, said tubular member having a hexagonal socket at one end to engage the external hexagonal collar of said valve assembly, and means at the upper end of said shaft and said tubular member whereby said shaft and said tubular member may be gripped for turning to securely engage and remove said hydrant valve assembly.

6. A tool for removing or replacing a valve assembly in a hydrant or the like, comprising an elongated shank, a threaded tap secured to the lower end of said shank, a tubular member surrounding the shank, a polygonal socket attached to the lower end of said tubular member, and rotating means at the upper end of said shank to effect rotation of said tap to threadedly en-

gage the inner upper portion of said valve assembly with said tap while said polygonal socket of said tubular member is in engagement with an extending collar upon said valve assembly.

7. As a new article of manufacture, a tool for removing hydrant valve assemblies and the like, comprising a body member having a longitudinal passage extending therethrough from end to end and formed at its lower end with a polygonal socket to engage the laterally extending polygonal collar of a valve assembly for turning the same, a shank located in the longitudinal passage in said body member and provided at its lower end with a tap to engage the upper interior portion of a valve assembly, and means at the upper end of said body member whereby said body member may be gripped for turning to remove said valve assembly.

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