

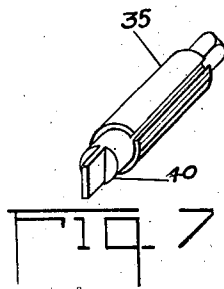
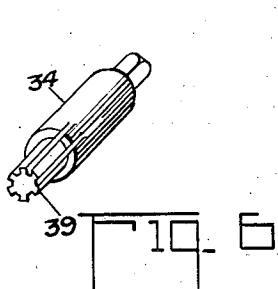
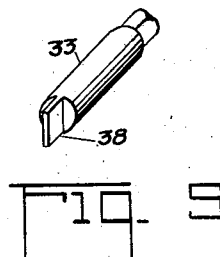
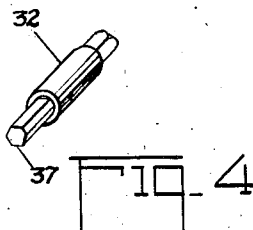
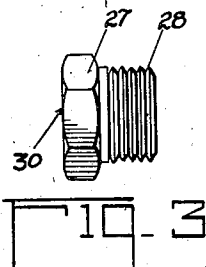
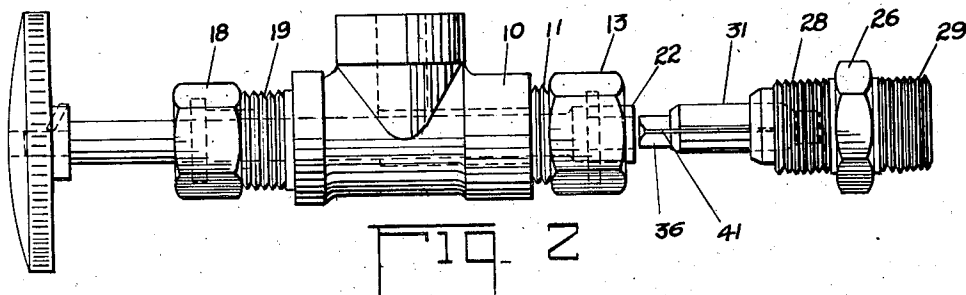
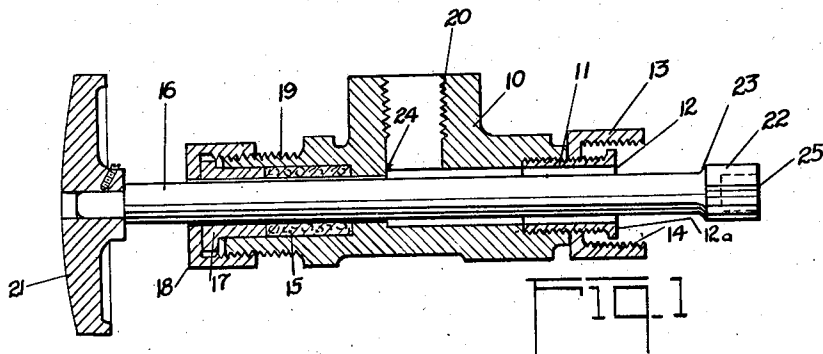
Sept. 14, 1937.

W. TREFNEY ET AL

2,092,941

UNIVERSAL VALVE TOOL

Filed May 11, 1937



INVENTORS
William Trefney
Ernest Edward Condon
BY *H. K. Anderson*
ATTORNEY

UNITED STATES PATENT OFFICE

2,092,941

UNIVERSAL VALVE TOOL

William Trefney, Jamaica, and Ernest Edward Condon, Flushing, N. Y., assignors to C-Y Manufacturing Company, Jamaica, N. Y.

Application May 11, 1937, Serial No. 141,924

3 Claims. (Cl. 137-111)

This invention relates to improvements in universal valve tools and more particularly to valve tools for service men working on electric refrigerators and the like.

5 An object of the invention is to provide a valve tool that may be used to operate the valves of a large number of different makes of refrigerators without permitting any of the refrigerant to escape while testing the vacuum and pressure in the system.

10 Another object of the invention is to provide a tool of the character described in which the valve structure proper is always completely assembled, ready for use and the application of this structure to various makes of refrigerators is accomplished by the use of interchangeable threaded connectors and interchangeable extensions.

15 Other objects of the invention will be apparent from the following specification which, taken in connection with the annexed drawing disclose a preferred embodiment of the invention.

20 It will be understood, however, that this embodiment is merely illustrative and that construction may be considerably varied without departing from the scope of the appended claims.

25 In the drawing:

Figure 1 is a longitudinal sectional view of the valve structure embodying the invention;

30 Figure 2 is an external view of the valve structure, Figure 1, showing one of the threaded connectors and one of the extensions used therewith;

Figure 3 is an external view of another type of connector used with the valve, Figure 2; and

35 Figures 4-7 inclusive are views of different extension members which in combination with the connectors permit the tool as a whole to be used with a large number of makes of refrigerators.

40 Mechanical refrigerators, especially those of the small household type operated by an electric motor connected to a small compressor, are commonly equipped with what is known as a charging and purging valve through which liquid refrigerant may be introduced to the system and the machine charged for operation. In connection with testing such refrigerators, it is often necessary to take gage readings of the pressure and vacuum in the system or to add additional liquid refrigerant, or to operate the purging and charging valve or some other valve on the machine for the purpose of pumping down the system or doing other work.

50 In all cases, it is desirable when operating the valve on the refrigerator to do so without losing any of the refrigerant which is usually under pressure within the system and unless a special

tool is used such as herein illustrated and described, there is danger of losing the gas and it is difficult to take gage readings.

As a precaution, the valves on refrigerators are usually capped so that no leakage can occur 5 around the stem of the valve and heretofore it has been customary to remove this cap, put on a valve somewhat similar to that shown in Figure 1 of the instant application, engage the stem of the valve on the refrigerator with the movable 10 stem of the service valve, open the latter and thereby obtain gage readings, recharge or do such other work as may be necessary. Obviously, this requires a separate valve similar to the arrangement shown in Figure 1 for each make of refrigerator 15 as the valves on the different makes of refrigerators differ, some valves being threaded internally and others externally for the reception of the valve tool, and the stems of these valves being of different configuration some of them 20 being adapted to take a square shank tool, others a slotted tool and others a splined tool.

The present invention eliminates the necessity of a service man carrying about a special valve for each make of refrigerator he may encounter. 25 It enables him with a single valve tool as herein described, to service a large number of refrigerators. For example, one valve body as shown in Figures 1 and 2 with six connectors as shown in Figures 2 and 3, and five extensions as shown in 30 Figures 2 and 4-7 inclusive will service the fifteen leading makes of refrigerators on the market today as well as a large number of refrigerators made by smaller companies whose products are not in extensive use. In other words, a service 35 man equipped with one of the valve tools, the subject matter of this application, is relieved of the necessity of either carrying around with him a large number of valve bodies adapted to fit different makes of refrigerator valves or making up 40 on the job some makeshift arrangement to enable him to service these refrigerators.

Referring now to Figure 1, a T designated by the numeral 10 is interiorly threaded as shown at 11 to receive the threaded spud 12 on which 45 is supported the threaded nut 13 which is interiorly threaded as shown at 14.

The other end of the T shaped body 10 is bored out as shown at 15 to contain a suitable packing which is forced into engagement with the stem 16 50 by means of the head 17 which is forced inwardly by means of the nut 18 which is threaded on to the threaded portion 19 of the T.

A tapped hole 20 is provided in the T as shown, for the reception of a gage or this may be plugged 55

so a gas bottle or any other testing or charging equipment can be connected thereto.

The stem 16 is provided with a detachable handle 21 and it will be noted that this stem is freely slidable longitudinally through the body of the T but that gas or liquid is prevented from passing outwardly by reason of the packing in the bore 15.

The outer end of the stem 16 is formed into a socket 22. This may be pulled all the way into the body of the valve until the portion 23 thereof comes against the face 24 in the bore of the T which aids in sealing the valve and preventing escape of gas outwardly past the packing in the bore 15. The groove 25 is made in the circular outer edge of the socket so that at all times gas and liquid are free to pass downwardly through the bore 20 and along the stem and outwardly into the refrigerator valve presently mentioned. In order to accommodate the valve body to various makes of refrigerators, a plurality of threaded connectors such as 26, 27 are provided. These may be threaded exteriorly as shown at 28 to engage the threaded portion 14 of the nut 13 whereby they can be attached to and from part of the tool. These may be threaded exteriorly as shown at 29 to engage female threads on the refrigerator valve or they may be threaded interiorly as indicated at 30, Figure 3, to engage male threads on the refrigerator valve, and these connectors can be made of different lengths. For use with the connectors, a plurality of extensions are provided, as shown at 31, 32, 33, 34, and 35. These connectors are all provided on the tool end with suitable male sockets as shown at 36 which socket engages the corresponding female socket in the valve stem 22, and at their outer ends these connectors are equipped with various types of sockets or other engaging means such as shown at 37, 38, 39, 40 which are adapted to engage correspondingly slotted, hexagonal or splined valve members of the refrigerator valves.

From the foregoing it will be seen that in operation it is merely necessary to attach to the refrigerator valve the proper threaded connectors such as 26, by screwing the male portion 29 thereof into the refrigerator valve. Then the proper extension such as 31 is placed in the connector 26, the socket 36 engaging the socket 22 of the stem 16.

The nut 13 is then screwed on to the exterior threads 28 of the connector. The shaft 16 being freely slidable through the body of the valve, it automatically adjusts itself for any length of connector and by turning the handle 21 and thereby rotating the stem 16 the refrigerator valve may be opened. Gas will find egress therefrom and out through the slot 41 which is provided along each extension, pass along the stem 16 and find its way up through the opening 20 and into a gage if one is attached therein thereby enabling the service man to test the gas pressure.

If the service man desires to charge a refrigerator he merely connects the gas supply to the opening 20 and the process is reversed.

To close the refrigerator valve the above described process is reversed.

It will be observed that by the use of the tool herein described various tests and charging of refrigerators can be accomplished with the loss of very little gas, and that by providing the interchangeable connectors and extensions, necessity for the service man carrying a large number

of valves or fittings from which to make up valve assemblies on the job is eliminated.

It will be observed that although the connectors and extensions of this tool are quickly detachable that when in use all parts are sealed in gas tight relationship. For example, the packing in the bore 15 prevents the escape of gas at that end of the tool; the spud 12 has an outward extending lateral flange 12a so that when the connector such as 26 is drawn thereagainst by means of the nut 13 the connector is brought into gas tight relation with the tool. Obviously the connector can be brought into gas tight relation with the refrigerator valve and therefore the escape of gas from the tool while in use is prevented.

What is claimed is:

1. A universal valve tool comprising in combination, a body member forming a conduit, an operating stem extending through said conduit and slidably supported therein, a nut supported on said body and revolvable thereon, a threaded connector adapted for threaded engagement with said nut and adapted thereby to be clamped into gas tight relation with said body to extend the length of said conduit, an extension for said stem, connecting means on said stem and extension whereby said extension may be revolved by turning said stem, and means on the outer end of said extension adapted to engage and turn a valve stem.

2. A universal valve tool comprising in combination, a body member forming a conduit, an operating stem extending through said conduit and slidably supported therein, a nut threadedly supported on said body and secured thereto, a threaded connector adapted to engage said nut to extend the length of said conduit and to connect the same to a valve, an extension having a socket adapted to engage said stem whereby said extension may be revolved thereby, and means on the outer end of said extension adapted to engage and turn a valve stem.

3. A universal valve tool comprising in combination a body member having a conduit extending therethrough, said conduit having an enlarged bore at one end and being threaded in the other end and said body being threaded on its exterior overlying said enlarged bore, an operating stem extending through said conduit and slidably supported therein, packing in said enlarged bore about said stem, a head member adapted to compress said packing about said stem, a nut adapted to engage the exterior threads on said body to engage and force said head against said packing, an exteriorly threaded spud nut having an outwardly extending lateral flange and adapted to partially enter the threaded portion of said conduit, a nut supported on said spud, a connector having an exteriorly threaded portion adapted to be engaged by said last nut whereby said connector can be locked in gas tight relation to said spud to form an extension of said conduit, said connector being threaded at its outer end for engagement with a valve, and an extension member adapted for socket engagement with said stem to extend the latter to a point within or beyond said connector, said extension member having its outer end formed to engage and turn the stem of a valve when the stem of said tool is rotated.

WILLIAM TREFNEY.

ERNEST EDWARD CONDON.