Dec. 23, 1958 W. R. SCHULTZ 2,865,182

SELF-CONTAINED WATER COOLER OF THE BUBBLER TYPE

Filed Sept. 21, 1956 3 Sheets-Sheet 1

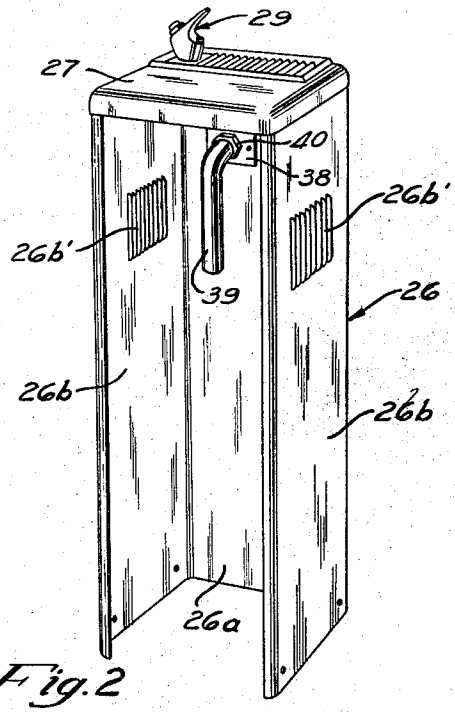


Fig. 2

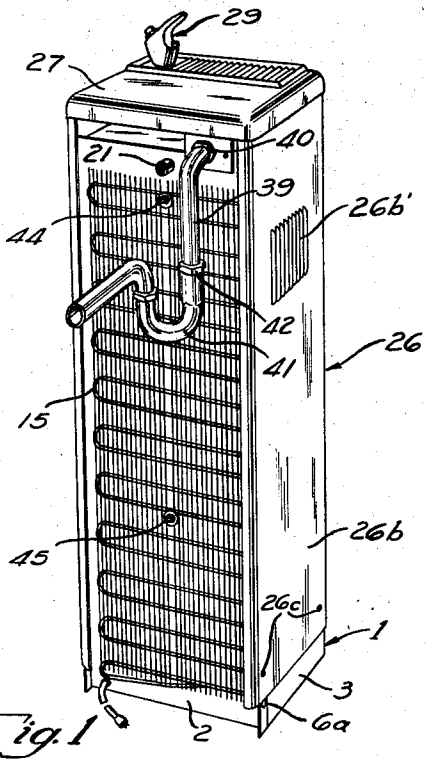


Fig. 1

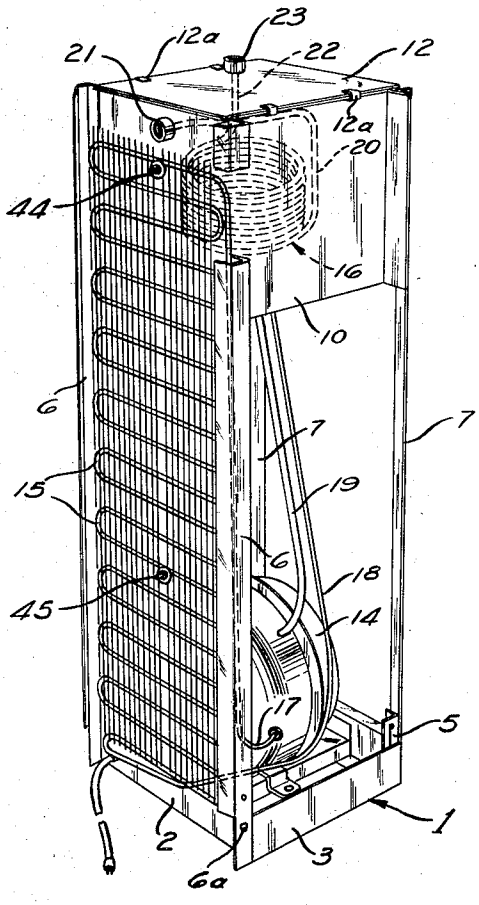


Fig. 3

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SELF-CONTAINED WATER COOLER OF THE BUBBLER TYPE

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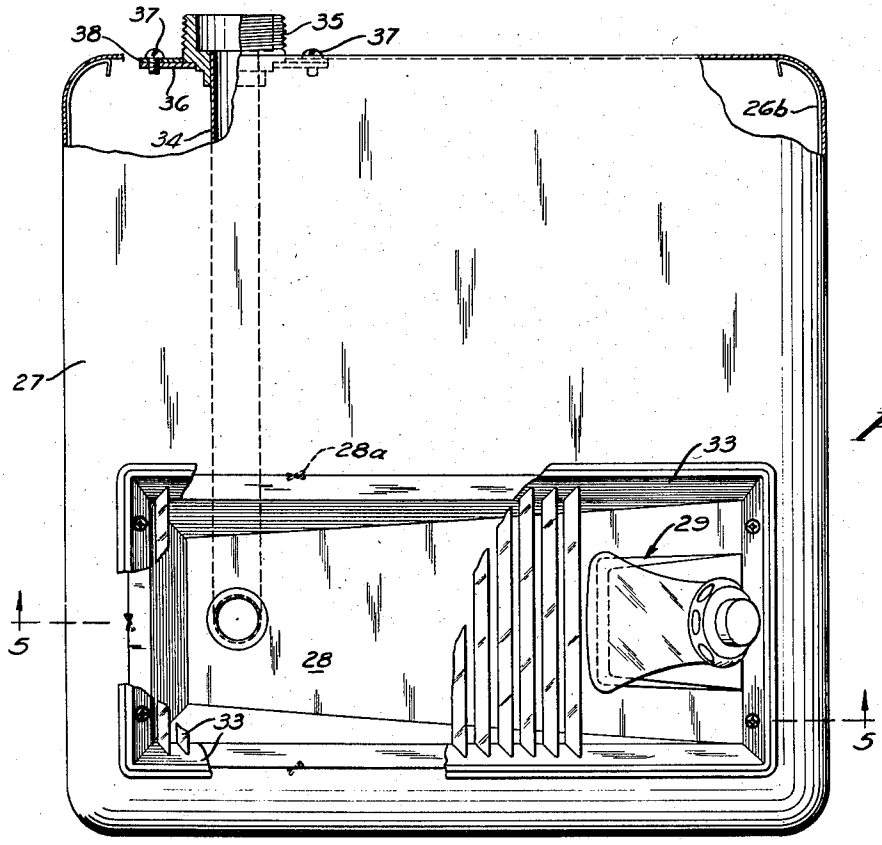


Fig. 4

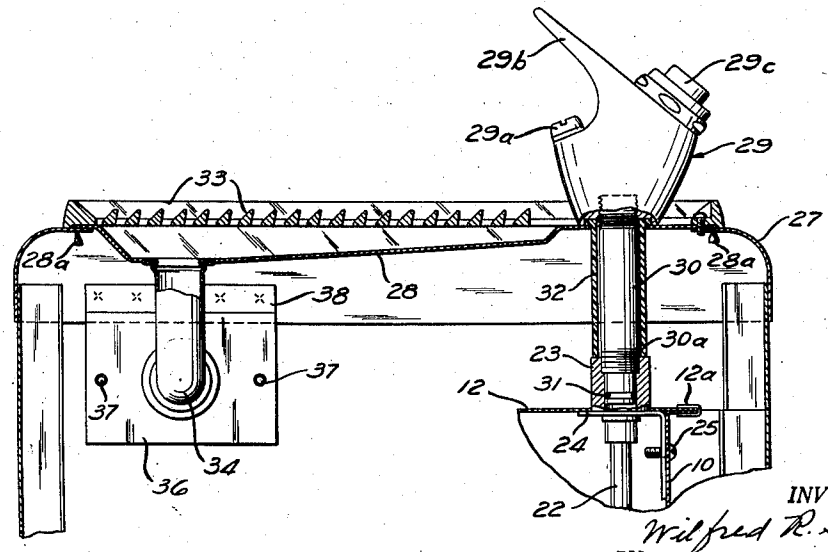


Fig. 5

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SELF-CONTAINED WATER COOLER OF THE BUBBLER TYPE

Filed Sept. 21, 1956 3 Sheets-Sheet 3

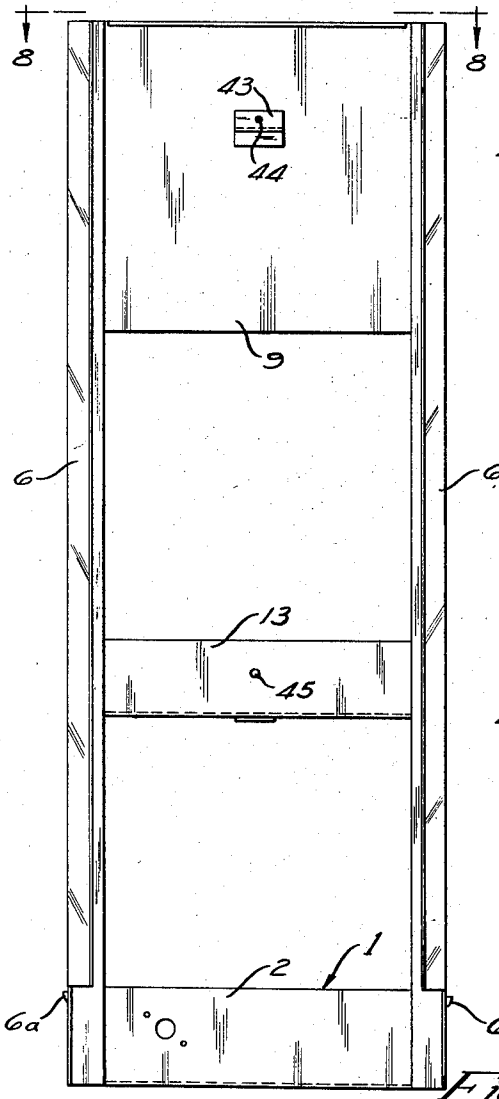


Fig. 6

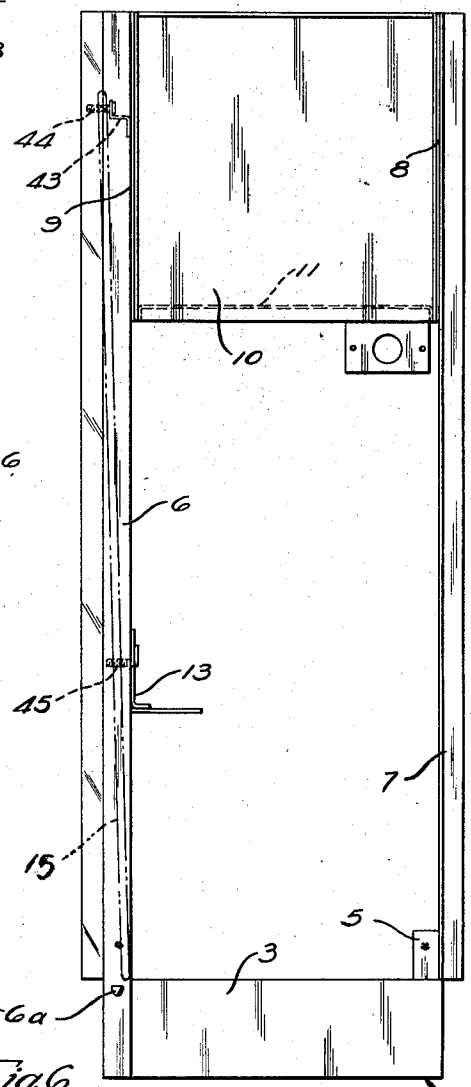


Fig. 7

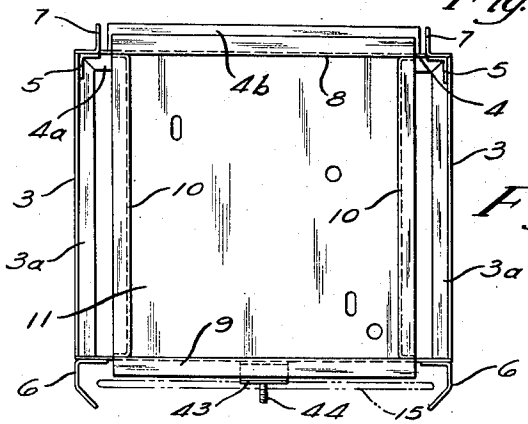


Fig. 8

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2,865,182

SELF-CONTAINED WATER COOLER OF THE BUBBLER TYPE

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Application September 21, 1956, Serial No. 611,290

4 Claims. (Cl. 62—298)

This invention relates to improvements in self-contained cabinet water coolers of the bubbler type.

Such coolers comprise mechanical cooling means and nozzle means, usually valve controlled, for projecting a stream of cooled water from which the user can drink while the waste water falls into a receptor basin and is conducted to a drain conduit. A cabinet structure is provided to support and house the mechanical cooling means and the other working parts of the cooler. Commonly the cooling means comprises a refrigerant-expanding cooling unit housed in the upper part of the cabinet, a motor driven refrigerant compressor usually housed in the lower part of the cabinet, and a refrigerant condenser operatively connected between the compressor and the evaporative cooler. The evaporative cooling unit has its water inlet connected to a water supply system and its water outlet connected to the bubbler nozzle. To permit the necessary servicing of the mechanical parts of the apparatus it is important that they be readily accessible.

A primary object of the present invention is to provide a cabinet structure for such coolers comprising a floor-supported frame structure adapted to support the motor driven compressor, the condenser, and the refrigerant evaporative cooling unit and an improved form of cabinet wall structure adapted to be quickly and easily completely removed from the frame structure so as to fully expose the apparatus normally enclosed by the cabinet.

A further and more or less ancillary object of the invention is to provide a novel form of cabinet wall structure comprising a top wall carrying a receptor basin and a bubbler nozzle and readily separable water conduit means for supplying the cooled water to the nozzle and readily separable drain conduit means, whereby the entire wall structure may be separated from the cabinet frame and the apparatus supported on it.

Another object of the invention is to provide a self-contained water cooler of the character indicated and realizing the objects already noted which is also well adapted for the use of a static type of refrigerant condenser.

A further object of the invention is to provide an improved wall structure and water supply and discharge structures designed in novel manner to facilitate fabrication and assembly of the various structural parts.

Further objects of the invention will be apparent from the following description of its preferred embodiment shown in the accompanying drawings.

The invention consists in certain forms, arrangements and combinations of parts which will be hereinafter particularly set forth and claimed with reference to the preferred embodiment illustrated.

In the drawings,

Fig. 1 is a perspective view of the water cooler embodying the invention.

Fig. 2 is a perspective view of the cabinet wall structure of the water cooler shown in Fig. 1 as the structure appears when separated from the cabinet frame.

Fig. 3 is a perspective view on a somewhat larger scale of the cabinet frame structure and some of the apparatus mounted thereon.

Fig. 4 is an enlarged plan view of the water cooler.

Fig. 5 is a vertical sectional view through the upper part of the water cooler, the section being taken on the line 5—5.

Figs. 6, 7 and 8 are, respectively, enlarged left side elevation, rear elevation and plan view of the cabinet frame structure of the water cooler.

In describing the apparatus disclosed in the drawings reference will first be had to the cabinet structure of the cooler which comprises a frame structure and a separately formed and detachable wall structure.

Of the frame structure shown in Figs. 3, 6, 7 and 8, the numeral 1 designates as an entirety a rectangular base structure having a rear side 2, right and left sides 3, 3 and a front side 4. The sides 3 are formed with bottom flanges 3*a*, 3*a*, designed to rest on a floor support and the front side 4 is similarly formed with a bottom flange 4*a* and also with a top flange 4*b*. The base structure comprises upright metal angles 5 to which the ends of the side and front parts of the base are welded, the metal angles being somewhat higher than the sides of the base. To the rear corners of the base structure are welded upright channel posts 6, 6 the channels of these members being disposed so that their re-entrant sides face each other (Fig. 8). To the front sides of the front corner angles 5, 5 are welded front angle posts 7, 7 of the same height as the rear posts 6, 6.

The upper ends of the posts 6, 6 and 7, 7 are rigidly connected together by a sheet metal box structure comprising a front wall 8, a rear wall 9, side walls 10, 10, and a bottom wall 11. This box structure is designed to house the evaporative cooling unit of the apparatus and to receive around the unit suitable insulating material, such as glass wool or the like. The top of the box structure is provided with a cover plate 12 which is secured to the flanged tops of the side walls of the box structure by means of a plurality of retaining clips 12*a*, 12*a* (Fig. 3). At a level somewhat below the box structure the rear side of the frame is provided with a transverse brace and support member 13.

The above described frame structure is designed to support the various working parts of the water cooling apparatus which for the most part may be of conventional construction and which comprise a motor driven compressor 14 of the hermetically enclosed type, a condenser 15 of the static type which consists of a tube bent to form a series of loops which extend horizontally back and forth and a large number of vertical surface-developing fins or slender rods welded to the loops of the condenser tube, and further comprise an evaporative cooling unit 16 which, as shown in Fig. 3, is of the helical coil type of construction in which a water coil and a refrigerant coil are wound in parallel and in heat transfer engagement with each other.

As is usual in such systems the compressor, condenser and the refrigerant coil of the cooling unit are connected in a closed circuit, the discharge opening of the compressor being connected by a conduit 17 to the top inlet of the condenser, the bottom of the condenser being connected by capillary tube 18 to the inlet end of the refrigerant coil of the cooling unit while a conduit 19 connects the discharge end of the refrigerant coil of the cooling unit to the suction inlet of the compressor. The bottom wall 11 of the insulation box is suitably apertured to accommodate tube 18 and conduit 19.

The compressor motor is provided with conventional automatic switch means (not shown) actuated by a thermostat associated with the cooling unit 16 so that the compressor operates to maintain the cooled water at a desired temperature.

A water conduit **20**, which is connected to the inlet end of the water coil of the cooling unit **16**, is provided with a pipe fitting **21** which can be connected with any suitable source of drinking water under pressure and is secured to the rear wall **9** of the frame structure.

The cooling unit **16** has an outlet conduit **22** provided with a fitting **23** to which is welded an angle-shaped supporting bracket **24** adapted to be secured by one or more screws **25** to the upper part of the insulation box of the frame structure (Fig. 5).

Referring now to the wall structure of the cooler cabinet, said structure comprises a sheet metal wrap-around element **26** forming the cabinet front wall **26***a* and two side walls **26***b*, **26***b*, each side wall being formed with louvers **26***b'* for circulation of air through the cabinet. The two sides **26***b* of the wrap-around wall element are formed near the bottom of the element with two holes located to register with screw holes drilled and tapped in the frame posts **5** and **6** to receive securing screws **26***c*, **26***c* (Figs. 1, 2, 3). Each of the posts **6** is formed with a stop lug **6***a* to be contacted by the lower edges of side walls **26***b* and support the element **26** with its screw holes in register with the tapped holes in posts **5** and **6**.

The cabinet wall structure further comprises a die-formed sheet metal top wall **27** which has a depending skirt that fits around and is welded to the upper edges of the front and side walls of the wrap-around element **26**. The top wall **27** is formed at its front side with an elongated rectangular aperture to receive a sheet metal receptor basin **28** formed at its edges with a plurality of depending ears **28***a* which pass through straight slots in the top wall **27** and are then twisted, as shown in Fig. 5, to secure the basin to the top wall **27**.

Vertically above the pipe fitting **23** the receptor basin **28** is apertured to accommodate a valve-controlled water nozzle fitting **29** and its connections. The fitting **29** comprises a nozzle proper **29***a*, sanitary guard **29***b* and a valve-actuating plunger **29***c*. The inlet opening in the bottom of the fitting **29** is formed with female tapered threads for the permanent attachment of a tubular nipple **30**. The nipple has its lower end formed to telescopically fit the bore of fitting **23** and near its lower end is grooved to receive an O-ring packing **31**. The nipple **30** is also formed with straight threads **30***a* to engage mating threads in the upper part of the bore of fitting **23**. A spacer sleeve **32**, which may suitably be made of one of the solid plastics, is interposed between the top of fitting **23** and the bottom of nozzle fitting **29**.

It will be seen that in the construction last described the O-ring **31** provides a fluid tight connection between the cooled-water fitting **23** and the nozzle fitting **29** which can readily be separated by turning the fitting **29** until the straight thread connection between nipple **30** and fitting **23** is broken, whereupon the nozzle fitting and nipple can be withdrawn from the fitting **23**. And obviously the reassembling of the parts can be effected with similar ease.

The basin **28** is covered by an anti-splash grid **33** which can suitably be formed of molded plastic material. The rectangular frame of this grid is flanged to fit around the edge of the receptor **28** and is suitably secured in position by a plurality of screws as indicated in Figs. 4 and 5.

An elbow-shaped drain pipe **34** has its short upright leg attached to the drain outlet of the receptor basin **28** preferably by a spinning operation to form a strong joint which is made water tight by a soft soldering operation. To the rear end of the longer horizontal leg of the drain pipe **34** is hard-soldered a pipe fitting **35** formed with external straight threads adapted to receive a coupling nut. An attachment plate **36** is hard-soldered to fitting **35** and this plate is secured by screws **37** to a depending apron **38** welded to the rear flange part of top wall **27** (Figs. 4 and 5).

An elbow drain tube **39** flanged at its upper end to

engage the exposed end of drain fitting **35** is secured to the latter by a coupling nut **40**. As shown in Fig. 1 the elbow **39** has a short horizontal leg and an elongated depending leg, the lower end of which is adapted to telescopically engage the inlet end of a conventional plumbing trap **41**, which may be fitted with a suitable packing nut **42**. The drain tube **39** can readily be separated from the trap by upward movement without disconnecting the trap from the plumbing conduit with which it is connected.

Reference is now made to the manner in which the previously described condenser **15** is arranged and supported in the cabinet structure of the cooler. As shown in Fig. 3 the condenser extends across the back of the cabinet between the oppositely facing channels formed by the rear posts **6**, **6** of the cabinet frame structure, the position of the condenser being also indicated by dotted lines in Figs. 7 and 8. To support the condenser in the position indicated a bracket **43** is welded to the rear wall **9** of the insulation box of the cabinet and to this bracket is welded a threaded stud **44** (Fig. 7) against which the upper end of the condenser is clamped by suitable nut and washer means, as indicated in Figs. 1 and 3. In addition a threaded stud **45** is welded to the transverse frame brace **13** and, in conjunction with suitable nut and washer means, serves to clamp the lower portion of the condenser in the position indicated.

It will be seen that with the condenser mounted in the manner described the channel posts **6**, **6** serve to protect the condenser and in addition form in conjunction with the rear wall **9** of the insulation box of the cabinet, a sort of stack which induces an upward circulation of air over the surfaces of the heated condenser.

From the foregoing description it will be seen that all of the water cooling apparatus is mounted on the unitary frame structure (as shown in Fig. 3) and that the entire unitary cabinet wall structure, consisting of the front wall, two side walls and the top wall (Fig. 2) can be removed from the frame as a unit in a manner to make all parts of the cooling apparatus fully accessible for inspection, repairs or other servicing. To accomplish such removal of the wall structure of the cabinet it is only necessary to remove the four securing screws **26***c* which connect the lower sides of the wall structure to the frame structure of the cabinet and to turn the valve fitting **29** until the threads of the nipple **30** are disengaged from the threads of the cooled water pipe fitting **23**. Thereupon the entire side and top wall structure, together with the grid **33**, basin **28** and drain pipes **34** and **39**, may be lifted vertically as a unit from the frame structure of the cabinet, this relative movement of the parts being permitted by the previously described telescoping engagement of the nipple **30** with the fitting **23** and by a similar engagement of the elbow drain fitting **39** with the drain trap **41**. The advantages of the present construction will be apparent to those who are familiar with the prior practice of constructing such cooler cabinets with a removable side panel, a practice which affords only limited accessibility for inspection, repair and servicing of the enclosed apparatus.

It will be apparent that when the unitary wall structure has been separated from the frame structure as above described not only is the apparatus below the cooler insulation box fully exposed, but by removing the cover **12** of the insulation box, all apparatus therein is made accessible.

The replacement of the wall structure of the cabinet following inspection or servicing, obviously can be effected quickly and easily.

The herein disclosed construction has certain further advantages in connection with the original fabrication of the cooler. Thus the subassembly consisting of receptor basin **28**, the elbow drain pipe **34**, its threaded fitting **35** and attachment plate **36**, are of such a nature that it can readily be handled in the course of fabrication as

a unit and can then be easily attached to the top wall of the cabinet by means of the securing screws 37 and ears 28*a*. Also, in case of needed repair of any of the parts of the basin-drain pipe subassembly, the simple manually-actuated securing means (ears 28*a* and screws 37) permit easy detachment of the subassembly from the top wall 27 so that needed repair of any of its parts is facilitated.

It will be appreciated also that the disclosed construction lends itself well to the use of the static type condenser since the condenser can be made of nearly the full height of the cabinet so as to attain desired condenser capacity. This result is also facilitated by the advantageous circulation of air over the condenser which has already been referred to.

While the various features of construction shown and described herein are such as are preferred it will be understood that the invention is not limited to the disclosed construction except as indicated in the appended claims.

What is claimed is:

1. In a self-contained cabinet water cooler of the bubbler type, the combination of a cabinet structure adapted to support and enclose mechanical means for cooling water to be dispensed, the said structure comprising an upright floor-supported frame, an outer wrap-around lateral wall element formed to cover the front and two sides of the frame and a rectangular top wall structure connected to the top of the wrap-around element and comprising a water receptor basin with a discharge outlet; a cooled water bubbler nozzle mounted on the upper side of the cabinet top wall; liquid tight cooled water conduit means adapted to connect the bubbler nozzle to the water discharge of a refrigerant-evaporating cooler mounted in the cabinet, the said conduit comprising a pair of mutually telescoping elements one of which is rigidly connected to the bubbler nozzle and the other of which is supported by the cabinet frame so as to permit the two elements to be separated by upward movement of the cabinet wall structure relative to the cabinet frame; a waste water drain conduit for the receptor basin extending rearwardly from the outlet of the basin to the rear side of the cabinet top wall; and a vertically disposed drain pipe separably coupled at its upper end to the drain conduit and having a straight lower end adapted to telescopically engage the upright leg of a drain trap and to separate therefrom when the drain pipe and cabinet wall structure are raised in relation to the cabinet frame.

2. A water cooler as claimed in claim 1 in which the water conduit connecting the bubbler nozzle and the evaporative water cooler comprises an O-ring packing operatively interposed between the telescoping elements to render the conduit water-tight.

3. In a cabinet water cooler of the bubbler type, the combination of a cabinet top wall element formed with an opening to receive a receptor basin; a basin formed to fit the said top opening and having a bottom outlet opening; a bent drain tube having an upright leg connected to the basin outlet opening and a horizontal leg extending to one of the sides of the cabinet top wall element; a threaded coupling element permanently connected to the end of the horizontal leg of the drain tube; and means for detachably securing the coupling element to a peripheral part of the cabinet top wall element.

4. In a self-contained cabinet water cooler, the combination of a cabinet structure comprising a floor-supported frame having channel shaped rear posts arranged with their channel recesses facing each other and a wall structure extending across the front and two opposite sides of the frame structure; an insulation box structure with upright side walls supported in the upper part of the frame structure for holding a refrigerant-expanding cooling unit; refrigerant compressing means supported in the cabinet below the insulation box; and a refrigerant condenser comprising a refrigerant conduit looped back and forth in a single plane to form a flat structure disposed between the channel posts and extending from the lower part to the upper part of the cabinet and adjacent to the rear wall of the insulation box, the cabinet structure, channel frame posts and the box serving cooperatively to induce circulation of air upward over the condenser when the latter is heated in operation.

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