Dec. 18, 1934. F. W. FIELDHOUSE 1,985,156

CONDENSER CLEANER

Filed Dec. 12, 1932

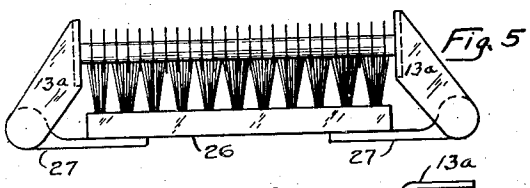


Fig. 5

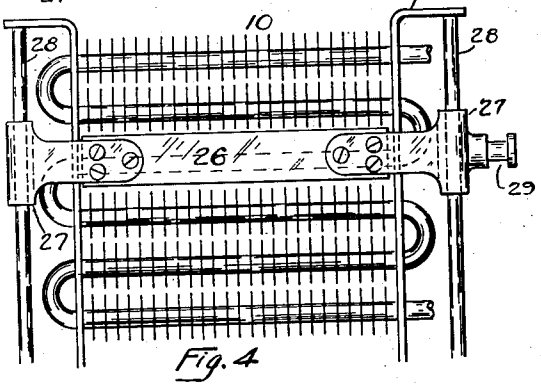


Fig. 4

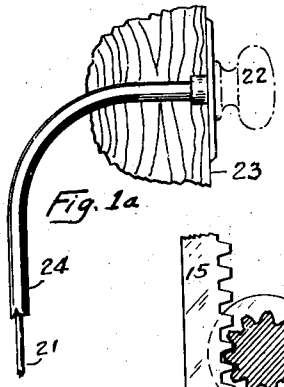


Fig. 1a

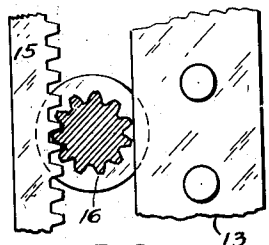


Fig. 3

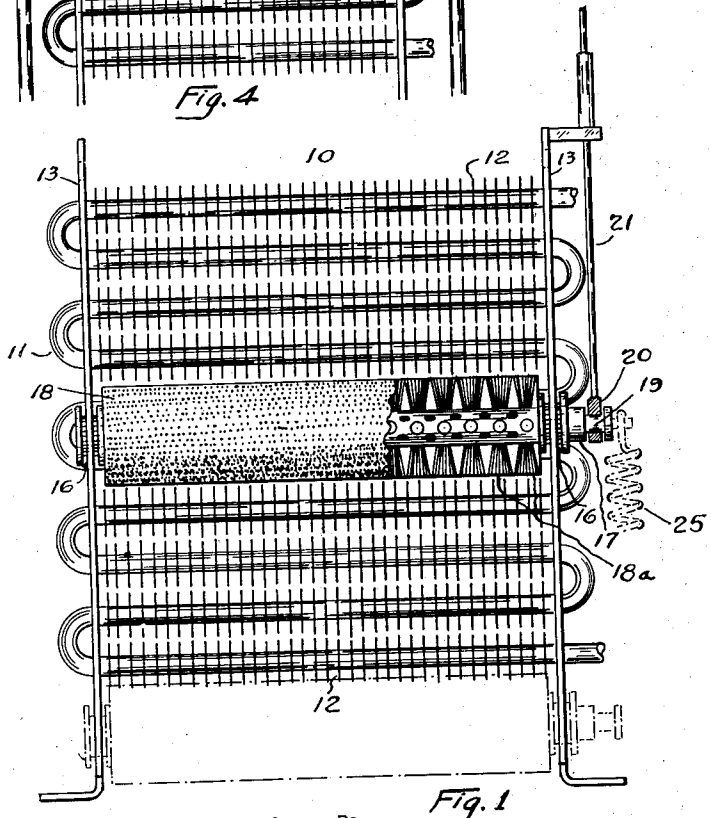


Fig. 1

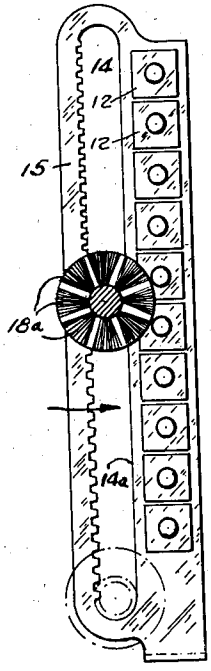


Fig. 2

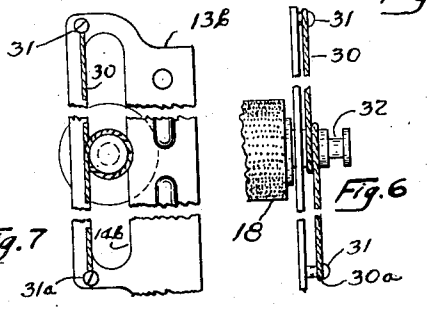


Fig. 7

Fig. 6

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CONDENSER CLEANER

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11 Claims. (Cl. 257—1)

This invention relates to an ever ready simply operated means for mechanically removing accumulated foreign matter from the surface of condensers or heating exchangers, which can be constructed as a part of the condenser and become a composite whole.

The prime object of this invention is the production of an efficient and inexpensive addition to the condenser of a household refrigerating unit to enable the owner to prevent the condenser from losing its efficiency, which invariably results from dust or other foreign matter which collects upon it without resorting to the usual procedure of locating a suitable brush, gaining access to an inaccessibly disposed condenser and removing the accumulation at a considerable effort or by calling a service man, with the attendant expense, to perform this distasteful and often neglected chore.

Manufacturers and dealers in household refrigerating units are ever confronted with complaints from owners, caused by the increasing duration of operating periods of the refrigerating unit required to maintain the normal low temperatures with consequent increased cost of electric current and increased as well as unnecessary wear of the apparatus, therefore, another object accomplished by this invention is manifested in increased life of and economy in the operation of refrigerating units. It is, of course, understood that the invention is not limited to such condensers, it can also be employed in connection with heat exchangers in general and certain phases of the invention are applicable to other equipments.

The means employed according to this invention constitutes structure wherein the special cleaning equipment can be built into the unit during its manufacture, or it can be subsequently lodged adjacent to same, and organized to function as if it had been originally built into the apparatus.

It is at once apparent that the apparatus provided by this invention for maintaining the condenser at full normal capacity would enable a given size of refrigerating unit to care for a greater cubical space than if the condenser element of the unit were not so equipped.

Other objects and advantages of the structure are here-in-after set forth in detail and will be apparent to persons skilled in the art to which the invention relates.

The preferred forms are particularly illustrated in the accompanying drawing, which forms part of this application for Letters Patent, and wherein corresponding characters refer to like parts in the several different views.

Figure 1 represents a front elevation of a condenser to which is attached the cleaner element and associated apparatus for directing as well as causing its operation. Fig. 1A indicates a detached part of the apparatus shown in Fig. 1.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 is an enlarged elevation of a section of the gear, rack and guide member for the cleaning element.

Fig. 4 is a portion of the same type of condenser shown in Fig. 1, however, a different kind of condenser cleaner element, which is illustrated in Fig. 5, is utilized for accomplishing similar results to the rotatory type of brush employed in Fig. 1.

Fig. 5 is a top view of Fig. 4.

Fig. 6 is a section of a front view of a further modified means for operating a cleaner element, while Fig. 7 is a side elevation of Fig. 6.

Numeral 10 indicates a condenser of well known type in which 11 indicates tubes for carrying the fluid to be treated. 12 indicates a series of sheet plates in intimate contact with the tubes to form fins, for the purpose of producing increased surface area, which practice is well known in the industry. The tubes are disposed in end pieces 13 which are shown modified from the usual form by having an elongated slot 14 fashioned therein which includes rack 15, which is to mesh with gears 16 disposed on shaft 17 which may take the form of a core in which are disposed groups of bristles 18*a* to form a cylindrical brush 18 and so located and disposed that upon movement they will contact with the fins 12 and remove dust, dirt or foreign matter impinged thereon as the result of air flowing in the direction of the arrow placed on Fig. 2.

In practice it has been found that practically all of the deposited matter will be found on the front surface of these fins and that the brush effectively removes said matter and preserves the normal radiating capacity of the condenser. However should additional tubes with fins be necessary, another brush can be disposed to service the added bank, as well as the rear faces of the front bank of fins. Shaft 17 is arranged with an outboard bearing at 19 which is journaled into eye 20 which is a terminus of rod 21, while the other end of said rod terminates at knob 22 preferably disposed on face 23 of a refrigerating unit and therefore made accessible to the owner so that the brush 18 can be caused to rotate by a simple pull and push movement thereby making

the operation very simple, even though the condenser be disposed at a remote location, which is usually the case.

It will be noted that rod 21, which is preferably of the "Bowden" wire type, is encased in a guide 24. In Fig. 1 the dot and dash outlined figure shown at the bottom indicates the rest position for the rotating brush. It will be noted that when the brush is so disposed it will be out of the path of the forced air circulation, in order that it will not interfere with same. Spring 25 can be added to the mechanism for the purpose of returning the brush to the rest position, which will insure the return of the brush to the desired location.

In Fig. 3 the gear 16 is shown as contacting with surface 14*a*, a margin of slot 14, as it traverses said slot which serves to assist in effecting a complete meshing of the gear with rack 15, also to produce a shaking or jarring action and transmit this force to the associated parts to assist in dislodging foreign matter. It will be noted that the teeth of the gear strike surface 14*a* with a rising and falling action during rotation and thereby set up the desired shaking action.

In Figs. 4 and 5 a non-rotating brush 26 is shown similarly traversing the face of condenser 10 and is guided by bearings 27 which slide on rods 28 attached to frame 13*a*. Bearing 29 is provided to be journaled in eye 20 should this type of brush be employed.

In Figs. 6 and 7 frame 13*b* has an elongated slot 14*b* without a rack and is organized to guide the cleaning brush and cause rotation by means of a cord or cable 30 attached to frame 13*b* by pins or screws 31, bearing 32 being provided to be journaled in eye 20 for operation as described for Fig. 1. Many other means are possible for giving the cleaning brush a rotating motion, for instance, it can be sufficiently weighted to return to the rest position at the bottom, by its own weight, and the lower end 30*a* of cord 30 can be removed from the lower pin, lengthened and led over a pulley (not shown) which upon being pulled would cause the brush to rotate upwardly and effect the desired cleaning.

With the object of this invention having been disclosed, many further modifications, substitutions or eliminations will assert themselves and the means for accomplishing same, therefore I do not wish to be limited to the specified forms shown and described, and desire to be limited only by the appended claims.

I claim:

1. A condenser cleaner comprising an operating means, a cleaning element, a cleaning element carrying means fixed in relation to a condenser and arranged to cause said element to contact said condenser and means to rotate said element and thereby remove accumulated foreign matter from said condenser.

2. A condenser cleaner comprising an operating means, a cleaning element, a cleaning element carrying means fixed in relation to a condenser and arranged to guide said element over the face of said condenser and means cooperating with said carrying means to rotate and reciprocate said element.

3. A condenser cleaner comprising an operating means, a cleaning element, a cleaning element carrying means fixed in relation to a condenser and arranged to guide said element over the face of said condenser and means cooperating with said carrying means to rotate and reciprocate said cleaning element and thereby remove accumulated foreign matter from said condenser.

4. A heat exchanger cleaning apparatus including a cleaning element organized to engage and traverse the heat exchanger, a supporting and guiding structure for said element and means cooperating with said structure to rotate said element and cause it to traverse said heat exchanger.

5. A heat exchanger cleaning apparatus comprising a track, a rotatory cleaner member movably supported by said track and means cooperating with said track to rotate and reciprocate said cleaner member.

6. A heat exchanger cleaning apparatus comprising a track; a rotary brush cleaner member movably supported by said track and means for imparting a reciprocative rotating movement to said cleaner.

7. The combination in a heat exchanger cleaning apparatus of a rotatory cleaning element equipped with a gear mounted adjacent thereto in mesh with a rack cooperating with said gear for operating said element to cause same to rotate and to traverse said exchanger.

8. The combination in a heat exchanger cleaning apparatus of a rotatory cleaning element equipped with a gear mounted in mesh with a rack co-operating with said gear for operating said element, and means for applying a linear force, to cause said element to rotate and to traverse said exchanger.

9. The combination in a heat exchanger cleaning apparatus of a rotatory cleaning brush equipped with a gear in mesh with a rack cooperating with said gear and means for operating said brush to cause same to rotate and to traverse said exchanger and remove accumulated matter therefrom.

10. The combination in a heat exchanger cleaning apparatus of a rotatory cleaning brush equipped with a gear in mesh with a rack cooperating with said gear and means for operating said brush, by a linearly applied force, to cause said element to rotate and to traverse said exchanger and remove accumulated matter therefrom.

11. The combination in a heat exchanger cleaning apparatus of a cleaning element mounted thereon in a guiding device and means for operating said element to cause same to shake and sweep said exchanger.

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