July 8, 1958 D. C. PFEIFFER 2,842,199

HEAT RAY REFLECTING MEANS, ETC

Filed March 9, 1956 2 Sheets-Sheet 1

FIG. 1

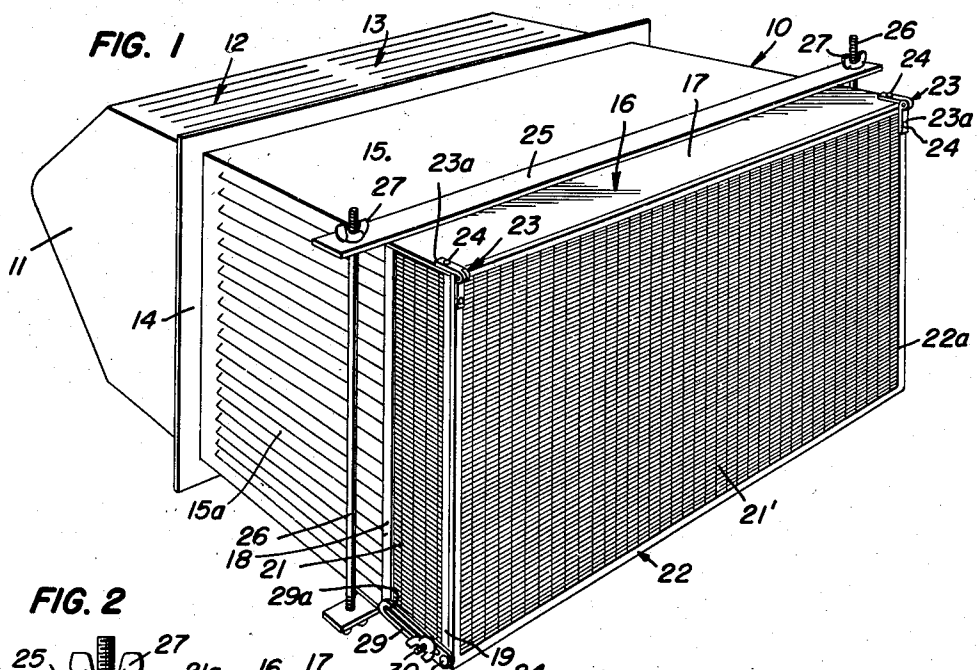


FIG. 2

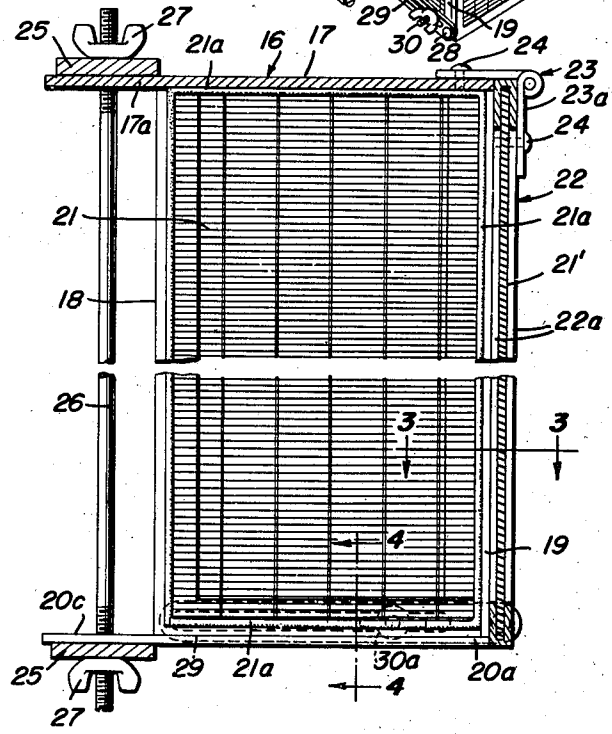


FIG. 3

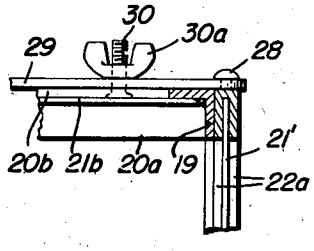
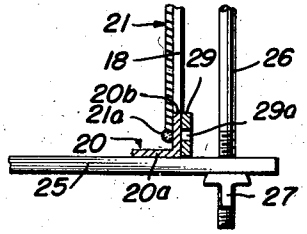


FIG. 4



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FIG. 5

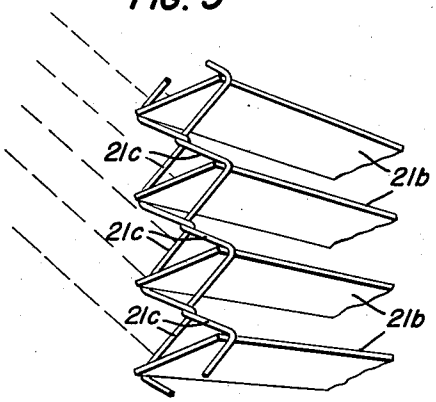


FIG. 7

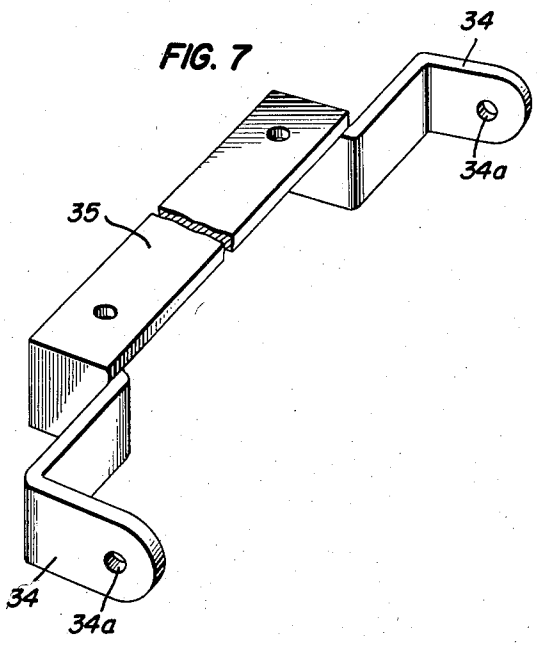
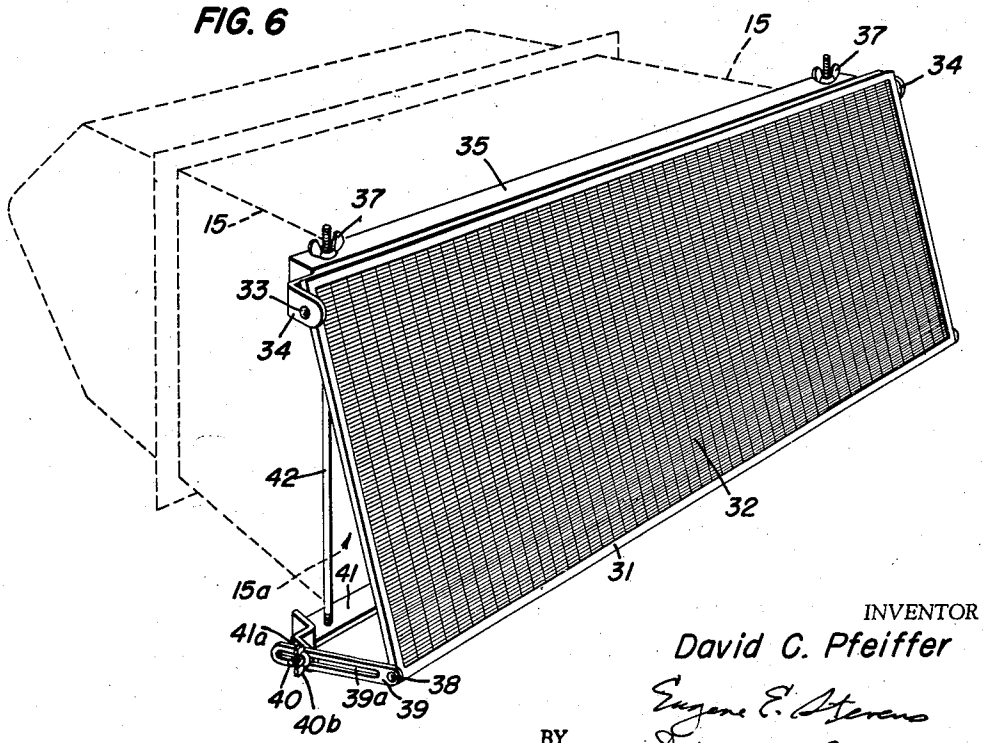


FIG. 6



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HEAT RAY REFLECTING MEANS, ETC.

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10 Claims. (Cl. 160—369)

My invention relates to air cooled condensers for air conditioning apparatus and other purposes, and it deals particularly with means for protecting such condensers and/or adjacent parts from direct contact with sun or other heat rays.

Although the invention is applicable to air cooled condensers generally for building air conditioning apparatus and other purposes, it has particularly reference to the so-called "room coolers" or "window type" of air conditioner unit. Hence, application of the invention to such a unit has been chosen for purpose of illustration herein. It is to be noted, however, that many present day air conditioner installations involve remotely located air cooled condensers which are exposed to sun rays.

It is, of course, a well known fact that the sun ray-produced heat tc which the condenser is subjected is a major factor in the total refrigeration load to which an air conditioner is subjected. Thus, various protective hoods and shutters have been devised to protect the condenser and adjacent metal parts against sun rays. But such expedients while effective enough for sun ray protection purposes, are objectionable in that condenser efficiency is reduced because they materially interfere with normal air circulation to and from the air cooled condenser. Also, the prior art suggestions are expensive and cannot be readily applied to existing condenser units.

Therefore, the primary object of my invention to overcome the objections aforenoted and to provide novel, improved and inexpensive sun ray reflecting means which can be readily applied by anyone to all types of condenser-incorporating units and which will not interfere with normal air circulation through the air cooled condenser.

More specifically stated, the invention contemplates the use of sun ray reflecting means in the form of a preferably metal screen-like sheet-form material made up of minute, fixedly spaced and substantially parallel panels which latter will preferably extend in a generally horizontal plane when applied to sun ray-exposed condenser areas, there being a novel carrier frame for such screen-like material and means for detachably securing such frame to a condenser unit or to the condenser end of a window type air conditioner.

The invention also resides in certain novel features of construction, combination and arrangement of the various parts of the now preferred form of the attachment which is shown in the accompanying drawings. However, it is to be understood that the drawing disclosures are to be considered as illustrative rather than limitative since it will be obvious to those versed in the art that the invention is susceptible of other mechanical expressions within the spirit and scope of the subject matter claimed hereinafter.

In the drawing, wherein the same reference characters have been used to designate the same parts throughout the several views,

Fig. 1 is a perspective view, largely diagrammatic, of a window type air conditioner unit showing the application of my sun ray reflector to the condenser containing end thereof;

Fig. 2 is a central vertical sectional view through the sun or heat ray reflector attachment of Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is an enlarged perspective view through the sun ray reflecting window screen-simulating material which is employed;

Fig. 6 is a perspective view of a modified form of the invention applied to the condenser end of an air conditioning unit which latter is shown in dotted lines; and

Fig. 7 is a broken perspective view of bracket-incorporating clamp bar which is employed in the form of the invention shown in Fig. 6.

Referring to the drawings by reference characters, and turning to Fig. 1, numeral **10** indicates diagrammatically a familiar window sill-supporting room cooler type of air conditioner unit. This unit **10** has the cool air circulating end **11** which projects into the room, there being the cool air output openings **12** and the air return openings **13**. The usual outstanding mounting flange **14** is shown, and the outwardly projecting end **15** of the unit has, as usual, adjacent its rear wall the condenser coils (not shown). The condenser end **15** of the unit is supplied with outside air through the opposie side openings **15***a* while the condenser air discharge is through the usual openings (not shown) in the rear wall of casing portion **15**. The condenser-occupied portion of the rear end **15** is shown in Fig. 1 as covered by my novel sun, or heat, ray-reflecting unit which is generally designated by reference character **16** and which will now be described.

Referring to Figs. 1 and 2, it will be seen that the sun, or heat, ray reflecting unit **16** comprises the top plate **17** which constitutes the upper end of a frame which carries side and rear ray-reflecting walls **21**, **21'**, respectively, of window screen-simulating material which will be described in detail hereinafter.

Continuing as to the wall-carrying frame, Fig. 2 shows that the two rear corners thereof are defined by the depending plate carried angle bars **19** while the forward side frame members are stiff, flat metal strips **18**. The lower ends of the frame members **18**, **19** are welded or otherwise secured to the upwardly extending flanges **20***b* of angle bars **20** which have the bottom flanges **20***a* extending laterally inward as indicated in Figs. 2 and 4.

It should here be noted that the bottom flanges **20***a* of the lower angle bars **20** have extensions **20***c* projecting forwardly beyond the frame members **18** and that such extensions **20***c* are arranged in opposition to the forward extension **7***a* of the frame top providing plate **17**. These plate and flange extensions have inherent flexibility, and underlie the clamp means shown in Figs. 1 and 2 which will be referred to hereinafter.

The screen form sun, or heat, ray deflecting sheet-form walls **21**, **21***a* are formed of window screen simulating material as shown in the Fig. 5 view, which view is drawn to enlarged scale to illustrate the flat sided substantially horizontal louvre-like members **21***b* which are fixedly secured in parallel relationship by twisted vertical strands **21***c*. The material will preferably be of bronze or other metal, but may be of other material.

As illustrated in Figs. 2, 3 and 4, the ray reflecting side walls **21** have their marginal portions welded as at **21***a* to the adjacent surfaces of frame members **18**, **20**, **19** and to the under surface of the top plate **16** of the frame.

The rear ray-reflecting wall or panel **21'** as indicated in Figs. 1 and 2, has its margins clamped between the walls **22***a* of a frame **22** which is U-shaped in cross-section, as shown in Figs. 2 and 3. This framed (**22**) rear

ray-deflecting wall **21'** is hinged as at **23** to the top plate **16** of the main frame for outward swinging movement, the hinge leaves **23***a*, **23***a* being secured as at **24** to the top plate **16** and to the frame **22** as illustrated in Fig. 2.

The reason for hingedly supporting the framed rear ray-reflecting wall **21'** for vertical outward swinging movement is to make it more effective under different service conditions. Thus, if the air conditioning unit is located with the condenser end **15** exposed to the south, the rear ray-reflecting wall **21'** will be more effective if it is in a vertical position. On the other hand, if the exposure is west, said ray-reflecting wall **21'** will be more effective if it is swung outwardly and retained, at say an angle of 30° from the perpendicular.

To maintain the framed (**22**) rear ray-reflecting wall **21'** at a predetermined outwardly swung angle, I provide at at least one lower end of the carrier frame **22** the position control bar **29** which is pivoted to swingable frame **22**, as indicated at **28**. This position control bar **29** has a longitudinally extending slot **29***a* which receives the threaded outstanding pin **30** which projects outwardly from the upstanding flange **20***b* of lower frame member **20** as indicated in Figs. 1, 2 and 3. A wing nut **30***a* on the threaded stud **30** serves, when tightened against slotted bar **29**, to retain the framed rear wall **21'** at a desired outward angle, or for that matter, to maintain it in vertical position.

As indicated in Figs. 1 and 2, the ray-reflecting attachment is secured to the condenser end **15** of the conditioner unit casing by means of tie rods **26** located at opposite sides and projected through transverse holes adjacent the ends of the top and bottom clamp bars **25**, which latter overlie casing portion **15** and the forwardly extending ends **17***a*, **20***c* of plate **17** and the bottom flange **20***a*, respectively. Wing nuts **27** serve to effectively clamp the plate and bar extensions **17***a*, **20***a* against the top and bottom of the casing portion **15**, the said extensions having sufficient inherent flexibility to admit of this, as previously noted.

Referring to the modified form of invention shown in Figs. 6 and 7, this form of invention dispenses with ray-reflecting walls **21** of Figs. 1 and 2 at the air intake sides of the condenser end **15** of the conditioner casing. In lieu of side walls, the modification provides a ray-reflecting screen **32** at the rear wall of said casing opposite the usual condenser air discharge openings (not shown) therein; and which screen will project a substantial distance beyond the casing sides, as indicated in Fig. 6.

Thus, referring to Fig. 6, the ray-reflecting screen **32** is carried by the endless frame **31**, the upper member of said frame being pivoted at each end, as indicated at **33**, to the outwardly offset, rearwardly extending bracket portion **34** which is integral with a top casing top-overlying clamp bar **35** which is shown in Fig. 7.

Cooperating with the top clamp bar **35** in securing the device of Fig. 6 to the casing portion **15** is a lower clamp bar **41**. The clamp bars **35**, **41** are, or may be, duplicates.

The casing bottom-underlying clamp bar **41** provides at at least one end the rearwardly extending and upwardly and outwardly offset bracket portion **41***a*. As shown in Fig. 6, a slotted link **39** is pivoted as at **38** to frame **31** and its slot **38***a* receives the threaded stud **40** which projects outwardly from bracket portion **41***a* of the lower clamp bar **41**. A wing nut **40***b* clamping slotted link **39** against bracket portion **41***a* serves to secure frame **31** in a set position.

The device of Figs. 6 and 7 is secured in place by means of tie rods **42** at each side of the casing portion **15**, and which tie rods pass through holes in the end portions of the upper and lower clamp bars **35** and **41** to receive clamp nuts **37**.

As will be understood, the device of Figs. 1 and 2 as well as that of Fig. 6 includes a frame which provides a

casing end-receiving socket (see **17***a*, **20***c*, **20***c*, **26**, **26** of Figs. 1 and 2; and **35**, **41**, **42** of Fig. 6). Such construction assures of firm clamping of the attachment to the conditioner casing.

From the foregoing it will be apparent that I effectively protect the condenser and adjacent parts against sun and other heat rays while permitting free air circulation to and from the condenser. It is also evident that all air conditioner and other condensers can be readily equipped with my ray-reflecting screen means so as to materially increase the efficiency of the same.

Having thus described my invention, what I claim is:

1. A sun ray guard for the air passage-providing end of an air cooled condenser casing, said guard comprising a mounting frame providing opposite wall clamp providing members adapted to overlie opposite wall portions of said casing end, a ray intercepting screen for overlying said casing end and opening therein, a carrier frame for said screen and detachably secured to said mounting frame, and clamp member connecting and actuating means adjacent other opposed walls of said casing end.

2. The structure of claim 1, and said ray-intercepting screen comprising minute, substantially parallel, fixedly spaced and horizontal ray-intercepting and reflecting louver-like panels, means horizontally pivoting said screen-carrying frame to said mounting frame whereby to admit of outward shifting of said frame so as to dispose said panels in different appropriate ray-intercepting positions, and screen frame position control means carried by one of said clamp-providing members.

3. A sun ray guard for the air passage-providing and air cooled condensed containing end of a room cooler casing, said guard comprising a frame member providing a socket-like casing end-receiving portion, opposed clamp members incorporated in the socket-like portion of said frame and adapted to extend beyond and overlie opposite wall portions of said casing end, actuating means connecting said clamp members adjacent other opposed walls of said casing end, and ray intercepting and reflecting screen means carried by said frame and overlying the end wall of said casing end.

4. The structure of claim 3, and there being frame-carried screen means overlying opposite sides of said casing end adjacent the exposed end wall of said casing end.

5. The structure of claim 3, and a carrier frame for said screen means and pivoted to said socket-providing frame for horizontal swinging movement, means for retaining said carrier frame in different adjusted positions; and said carrier frame and screen means extending beyond the sides of the casing end whereby to intercept rays directed toward the sides of the casing end.

6. In an air conditioner comprising a casing having an air cooled condenser-containing end portion which provides an air passageway for communicating with the condenser, a sunray guard including a socket-defining frame receiving a portion of the length of said casing end portion, said frame comprising a transverse casing top-supported load-carrying plate of a length substantially corresponding to the width of said casing end, the forward area of said plate constituting a longitudinally co-extensive casing-overlying clamp portion inwardly of the outer end of said casing, depending and generally U-form frame members rigidly secured adjacent opposite end portions of said plate rearwardly of said clamp portion to overlie the rear end-adjacent casing sides, a sunray-intercepting screen hinged adjacent the rear edge of said plate and overlying the rear casing end and the rear end of said frame, frame-carried screen-adjusting means operatively connected to the latter and operable to hold it in different predetermined positions with respect to said rear casing end, a forwardly extending casing bottom-overlying clamp portion carried by the bight portion of each of said U-form frame members and spacedly underlying the plate-provided clamp portion, opposed top and bottom

clamp-actuating bars extending beyond opposite sides of said casing end and overlying the respective plate and frame-provided clamp portions, and variable pressure-applying tie means connecting said actuating bars at opposite edges of the casing whereby to firmly and releasably engage said clamp portions with said casing.

7. The structure of claim 6, and wherein the bight portion of each U-form frame member is angle form in cross-section to provide a horizontal bottom flange, and wherein the second-mentioned clamp portions are provided in each instance by an extension of one of said bottom flanges.

8. In an air conditioner comprising a casing having an air cooled condenser-containing end portion which provides an air passageway for communication with the condenser, a sunray guard including a socket-defining frame receiving a portion of the length of said casing end portion, said frame comprising a transverse casing top-supported load-carrying plate of a length substantially corresponding to the width of said casing end, the forward area of said plate constituting a longitudinally coextensive casing-overlying clamp portion inwardly of the outer end of said casing, depending and generally U-form frame members rigidly secured adjacent opposite end portions of said plate rearwardly of said clamp portion to overlie the rear end-adjacent casing sides, a sunray-intercepting screen hinged adjacent the rear edge of said plate and overlying the rear casing end and the rear end of said frame, said screen including minute, parallel and spacedly connected louver-like horizontal panels, frame-carried screen-adjusting means operatively connected to the latter and operable to hold it in different predetermined positions with respect to said rear casing end to appropriately position said louver-like panels with respect to sunrays, a forwardly extending casing bottom-overlying clamp portion carried by the bight portion of each of said U-form frame members and spacedly underlying the plate-provided clamp portion, opposed top and bottom clamp-actuating bars extending beyond opposite sides of said casing end and overlying the respective plate and frame-provided clamp portions, and variable pressure-applying tie means connecting said actuating bars at opposite sides

of the casing whereby to firmly and releasably engage said clamp portions with said casing.

9. The structure of claim 6, and wherein the bight portion of each U-form frame member is angle form in cross-section to provide a horizontal bottom flange, and wherein the second-mentioned clamp portions are provided in each instance by an extension of one of said bottom flanges, and ray-intercepting screen means carried by each of said U-form frame members and the adjacent plate portion rearwardly of said clamp portions.

10. In an air conditioner comprising a casing having an air cooled condenser-containing end portion which provides an air passageway for communication with the condenser, a sunray guard including a socket-defining frame receiving said casing end portion, said frame comprising a transverse casing top-supported load-carrying clamp bar and a transverse casing bottom-engaging clamp bar, the ends of said clamp bars extending beyond the casing sides, manually operable draw-together tie means connecting related ends of said clamp bars at opposite sides of the casing for clamping the frame thereto, a bearing providing ear at each end of the load-supporting clamp bar and offset outwardly of the related casing side, said bearing ears extending longitudinally of said casing and with the bearing portions thereof located beyond the plane of said end thereof, a frame-carried sunray-intercepting and reflecting screen overlying said casing end and projecting beyond the plane of the sides thereof whereby to protect end-adjacent portions of the latter against sunrays, means hingedly connecting the screen frame to said ear bearings for vertical swinging movement, and adjusting and position-retaining means at at least one end of said screen frame and including a portion carried by the adjacent extended end of said second-mentioned clamp bar.

References Cited in the file of this patent

UNITED STATES PATENTS

2,294,664	Hubbard	Sept. 1, 1942
2,359,051	Roper	Sept. 26, 1944
2,370,521	Bourke et al.	Feb. 27, 1945
2,545,906	Watkins	Mar. 20, 1951