Sept. 22, 1942. A. R. EVANS 2,296,815

DEMONSTRATING DEVICE

Filed Dec. 11, 1941

Fig. 1.

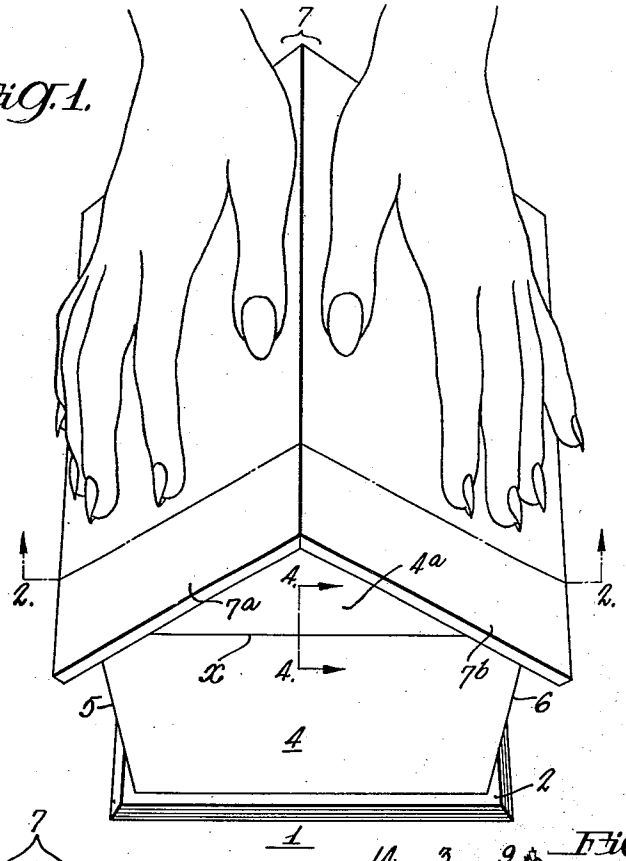


Fig. 4.

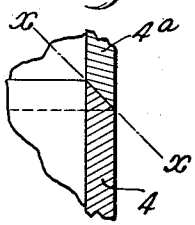


Fig. 2.

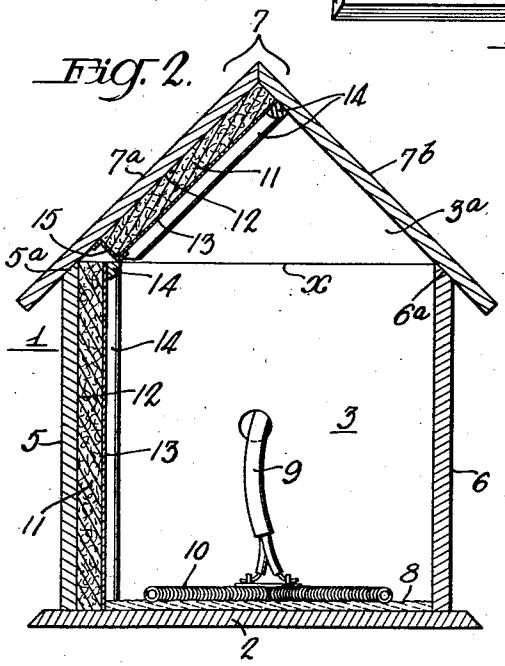
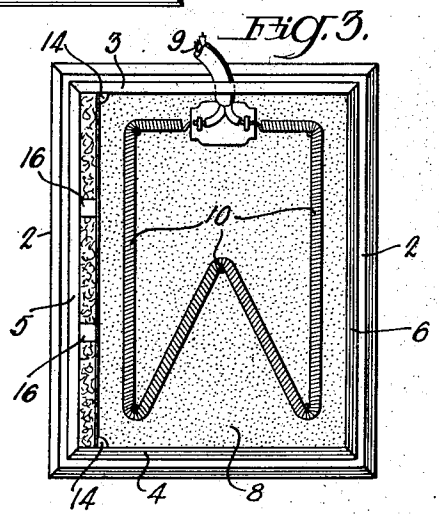


Fig. 3.



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2,296,815

DEMONSTRATING DEVICE

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Application December 11, 1941, Serial No. 422,589

5 Claims. (Cl. 35—19)

This invention relates to a simple, highly efficient device for demonstrating the value and effectiveness of thermic insulation in the wall and roof structures of dwellings and other buildings or enclosures.

The device is constructed in a manner to enable a person to make a comparison, by his or her own sense of touch, between one part of a roof, or wall, which is properly insulated, and another part which is devoid of thermic insulation.

In the accompanying drawing:

Fig. 1 is a perspective view of the device in use;

Fig. 2 is a sectional elevation taken on the line 2—2, Fig. 1;

Fig. 3 is a plan view of the device with the roof structure removed; and

Fig. 4 is a sectional view of a structural detail taken on the line 4—4, Fig. 1.

The device, as shown in the drawing, includes an enclosure 1, of any desired shape or dimensions, including a base 2, end walls 3 and 4, respectively, side walls 5 and 6, respectively, and an inverted V pitched roof 7, in the present instance, comprising two adjacently-disposed portions 7*a* and 7*b*, respectively, all of which combined are intended to simulate a simple dwelling, storage shed, or other building, etc.

Preferably, the walls and roof are composed of wood, such as ordinary ply-wood for example, although any other material capable of conducting heat from the interior to the exterior of the enclosure may be used without departing from the spirit of the invention.

In the present instance, the base 2 is provided with a foundation layer or body 8 of asbestos, fire clay or other suitable fire-proof, dielectric material having a minimum degree of heat-transferring properties.

Disposed on or suitably secured to the foundation 8 is an electric or other suitable heater 10, for heating the interior of the enclosure 1 to a sufficiently high temperature for the internal heat to be transferred, through and by the materials of the walls and roof from the interior of the enclosure 1 to the exterior surfaces thereof.

In the present instance, the heater 10 is in the form of an elongated coil of small diameter distributed over substantially the entire area of the foundation 8 for heating the interior of the structure 1 uniformly throughout.

The heater 10, in the present instance, is supplied with electric energy from any suitable ordinary household outlet, for example, through a cable 9 provided with an ordinary screw or prong plug, such as are used with domestic electric appliances operating on 110 volt current, although any other suitable coil of suitable voltage may be used.

In the present instance, one wall 5 and one-half 7*a* only of the roof 7, are each provided with a layer or body of rock or mineral wool or other suitable thermic insulating material 11, lying in direct contact with the inner surfaces 12, 12 thereof between said surfaces and relatively-spaced confining sheets 13, 13 of mica or other non-inflammable and preferably transparent material through which the thermic insulating material may be readily seen.

Any suitable means may be provided for securing the confining sheets 13, 13 in place, such as corner moldings 14, 14.

In the roof 7, the lower edge of the body 11 is confined by a Z-shaped bar 15 of metal or other suitable material, which is secured exclusively to the roof structure.

In the side wall 5, uprights 16, 16, spaced apart and simulating the studding in a frame building, are secured to the wall 5, with the thermic insulating material in between such studding, as it would be in the wall of a dwelling, for example, and the top edge of the compartment formed by and between the inner surface of the wall 5 and the adjacent, relatively-spaced, confining sheet 13 is left open for inspection of the material 11.

In order to inspect the interior of the structure, including the insulating material 11, the two sides 7*a* and 7*b* of the roof 7 are secured together along the ridge formed by the angularly-disposed sides or halves of the roof, these are secured to the upper portions 3*a* and 4*a* of the end walls 3 and 4, respectively.

The upper ends 3*a* and 4*a* of the end walls 3 and 4, respectively, are detachable from the lower portions of said end walls along planes *x*—*x* (see Fig. 4) which form perpendicular continuations of the upper edges 5*a* and 6*a* of the side walls 5 and 6 on which the under sides of the roof parts 7*a* and 7*b* rest (see Fig. 2).

The device is adapted to be used in the manner shown in Fig. 1, where the hands of a person are laid flatly on the roof parts 7*a* and 7*b*, respectively, or with the hands held flatly against the side walls 5 and 6, respectively, between the roof 7 and the base 2.

Current is then supplied to the heater 10 and the person is requested to state when and by which hand heat is first felt. The person is re-

quested to retain contact with both hands until relatively high temperature is felt by the one hand, while the structure under the other hand retains its original temperature, or a temperature modified only by the body heat of the person's hand.

The roof structure is then removed to show the person that the side which retained its original temperature, 7*a* or 5, as the case may be, was protected by the thermic insulation 11, and that the unprotected side, 7*b* or 6, as the case may be, was exposed to the internal temperature of the enclosure 1 and permitted the heat from inside the structure to be transferred through the unprotected roof or side wall to the outside of the structure to be dissipated into the surrounding atmosphere, indicating a heat loss from the interior of the structure 1.

From the above, the utility of the device in demonstrating the value of the thermic insulation in the roof structure and side walls of a person's home, etc., will be quite clear.

The demonstration from start to finish will consume less than five minutes' time, and is so positive and enlightening that it saves salesmen, engineers, contractors, and others untold hours which would otherwise be required to explain the theories of heat transfer, heat losses, etc., to prospects having no knowledge of the subject.

Obviously, the exterior of the device may depict windows, doorways, etc., to complete the simulation of a dwelling, although such depiction would serve no useful purpose insofar as the actual demonstration is concerned.

Having once disclosed the principles of the invention, many ramifications would readily present themselves to one having knowledge of the subject. For example, it would readily occur to a person with an active imagination that a visual demonstration could be provided by placing a layer of shaved ice or snow on each side of the roof. Obviously the layer on the non-insulated side would melt rapidly, while the layer on the insulated side would melt slowly, depending upon the temperature of the room in which the demonstration was made, or, if the demonstration is made outdoors in cold weather, melting of the layer on the protected side of the roof would be practically nil as against rapid melting of the layer on the unprotected side of the roof.

A similar simple visible demonstration may be made by saturating a cloth with water or some volatile chemical and laying it smoothly and flatly over both sides of the roof. The moisture will evaporate rapidly from the cloth overlying the unprotected side and give off a visible vapor, while the cloth on the protected side will retain its moisture content with little or no loss.

From the above, it will be clear that the device is adapted for giving comparative demonstrations, through a person's senses, touch or sight, or both, as to the value or expediency of having one's home protected by a thermic insulation of recognized efficiency.

I claim:

1. A heat transfer demonstrating device comprising an all-wooden enclosure simulating a typical frame dwelling in miniature and including opposite end walls, opposite side walls, and opposite angularly disposed sections of a ridged roof, a base, a source of heat on said base within said enclosure and normally impinging rays of heat against the interior surfaces of said opposite walls and roof sections, and a layer of mineral wool interposed between said source of heat and at least one of said interior surfaces adjacent such surface to prevent said impingement thereagainst, whereby the corresponding coextensive exterior surface of said enclosure will remain relatively cool in comparison to other exterior surfaces of the enclosure which correspond to and are coextensive with those of said interior surfaces against which said heat rays are permitted to impinge.

2. A heat transfer demonstrating device comprising an all-wooden enclosure simulating a typical frame dwelling in miniature and including opposite end walls, opposite side walls, and opposite angularly disposed sections of a ridged roof, a base, a source of heat on said base within said enclosure and normally impinging rays of heat against the interior surfaces of said opposite walls and roof sections, and a layer of mineral wool interposed between said source of heat and at least one of said interior surfaces in flat parallel contact with such surface to prevent said impingement thereagainst, whereby the corresponding coextensive exterior surface of said enclosure will remain relatively cool in comparison to other exterior surfaces of the enclosure which correspond to and are coextensive with those of said interior surfaces against which said heat rays are permitted to impinge.

3. A heat transfer demonstrating device comprising an all-wooden enclosure simulating a typical frame dwelling in miniature and including opposite end walls, opposite side walls, and opposite angularly disposed sections of a ridged roof, a base, a source of heat on said base within said enclosure and normally impinging rays of heat against the interior surfaces of said opposite walls and roof sections, and a layer of mineral wool interposed between said source of heat and the interior surface of one of said roof sections in flat parallel contact therewith to prevent said impingement thereagainst, whereby the corresponding coextensive exterior surface of said one roof section will remain relatively cool in comparison to the exterior surface which corresponds to and is coextensive with the interior surface of the other of said roof sections against which said heat rays are permitted to impinge.

4. A heat transfer demonstrating device comprising an all-wooden enclosure simulating a typical frame dwelling in miniature and including opposite end walls, opposite side walls, and opposite angularly disposed sections of a ridged roof, a base, a source of heat on said base within said enclosure and normally impinging rays of heat against the interior surfaces of said opposite walls and roof sections, and a layer of mineral wool interposed between said source of heat and the interior surface of one of said walls in flat parallel contact therewith to prevent said impingement thereagainst, whereby the corresponding coextensive exterior surface of said one wall will remain relatively cool in comparison to the exterior surface which corresponds to and is coextensive with the interior surface of the opposite wall against which said heat rays are permitted to impinge.

5. A heat transfer demonstrating device comprising an all-wooden enclosure simulating a typical frame dwelling in miniature and including opposite end walls, opposite side walls, and opposite angularly disposed sections of a ridged roof, a base, a source of heat on said base within said enclosure and normally impinging rays of heat against the interior surfaces of said opposite walls and roof sections, and a layer of mineral

wool interposed between said source of heat and the interior surfaces of one of said roof sections and one of said side walls in flat parallel contact therewith, whereby the corresponding coextensive exterior surfaces of said roof section and said side wall will remain relatively cool in comparison to the exterior surfaces of the other of said roof sections and the opposite side wall which correspond to and are coextensive with the interior walls of said second roof section and opposite side wall against which said heat rays are permitted to impinge.

ALFRED R. EVANS.