July 22, 1941. W. B. SHIMER 2,250,139

AIR CONDITIONING UNIT

Filed Sept. 20, 1939 4 Sheets-Sheet 1

FIG. 1

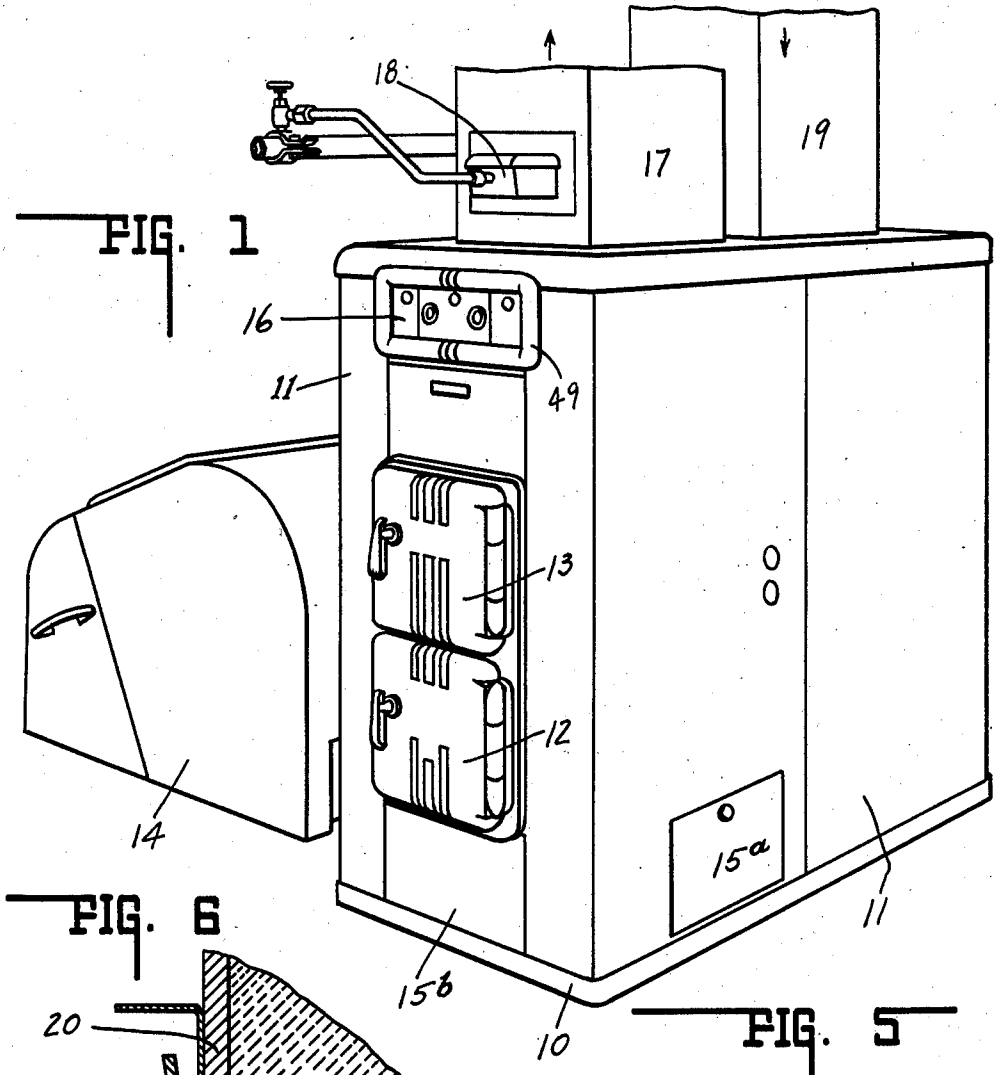


FIG. 6

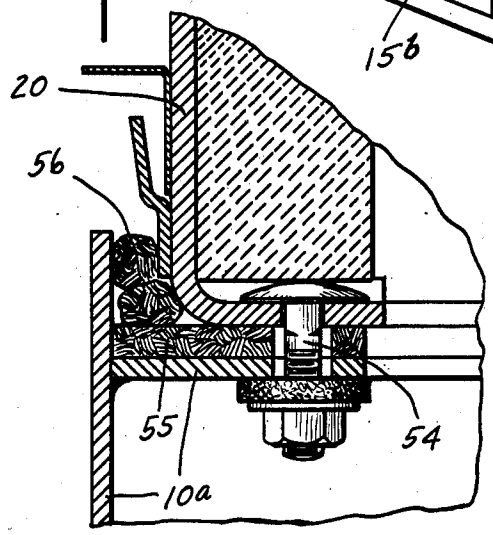
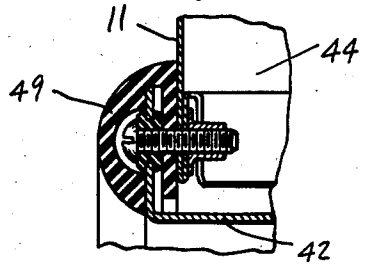


FIG. 5



INVENTOR.
WILLIAM B. SHIMER.

BY Lockwood, Goldsmith & Galt,
ATTORNEYS.

July 22, 1941. W. B. SHIMER 2,250,139

AIR CONDITIONING UNIT

Filed Sept. 20, 1939 4 Sheets-Sheet 2

FIG. 2

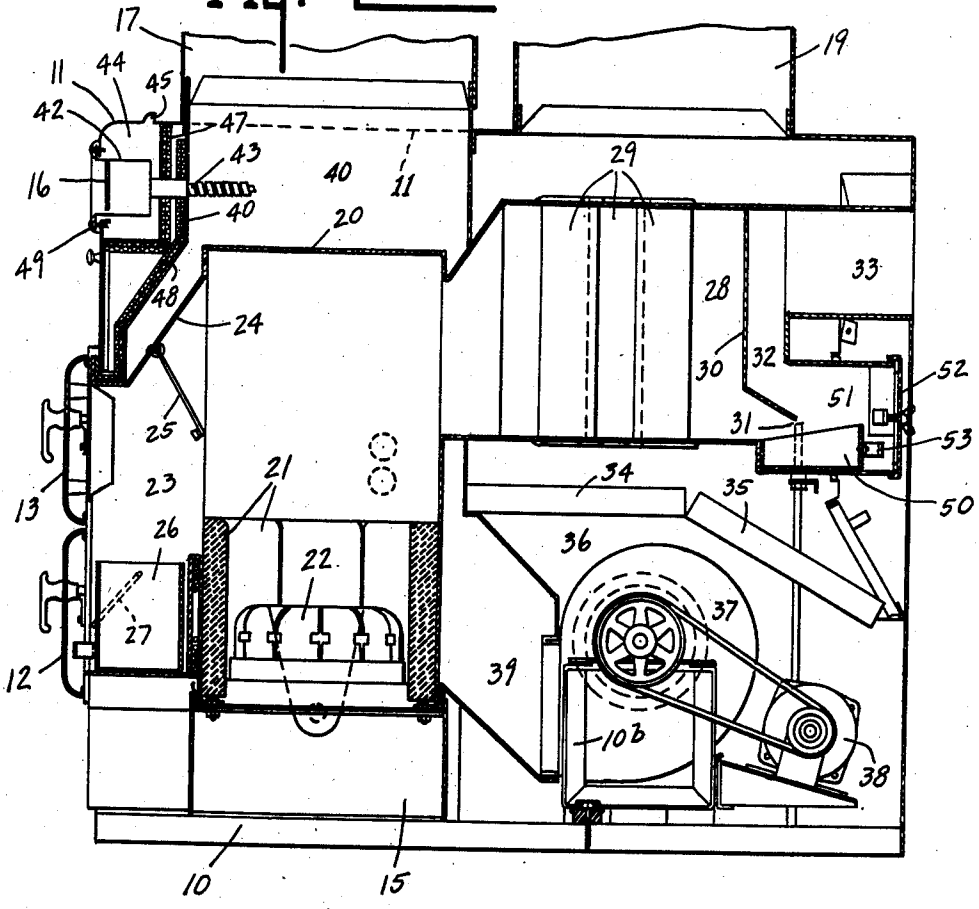


FIG. 7

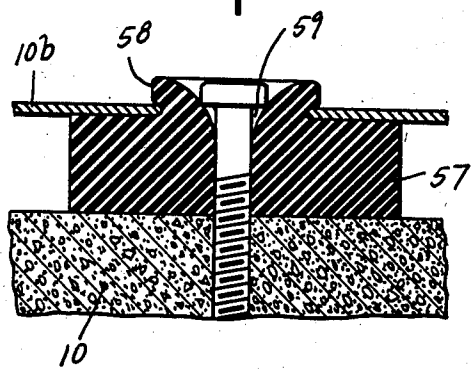
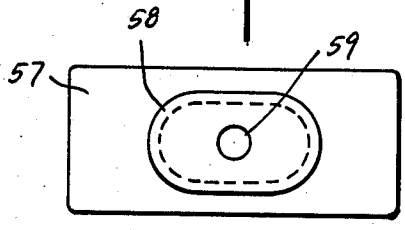


FIG. 8



INVENTOR.
WILLIAM B. SHIMER.
BY Lockwood, Goldsmith & Galt.
ATTORNEYS.

July 22, 1941. W. B. SHIMER 2,250,139

AIR CONDITIONING UNIT

Filed Sept. 20, 1939 4 Sheets-Sheet 3

FIG. 3

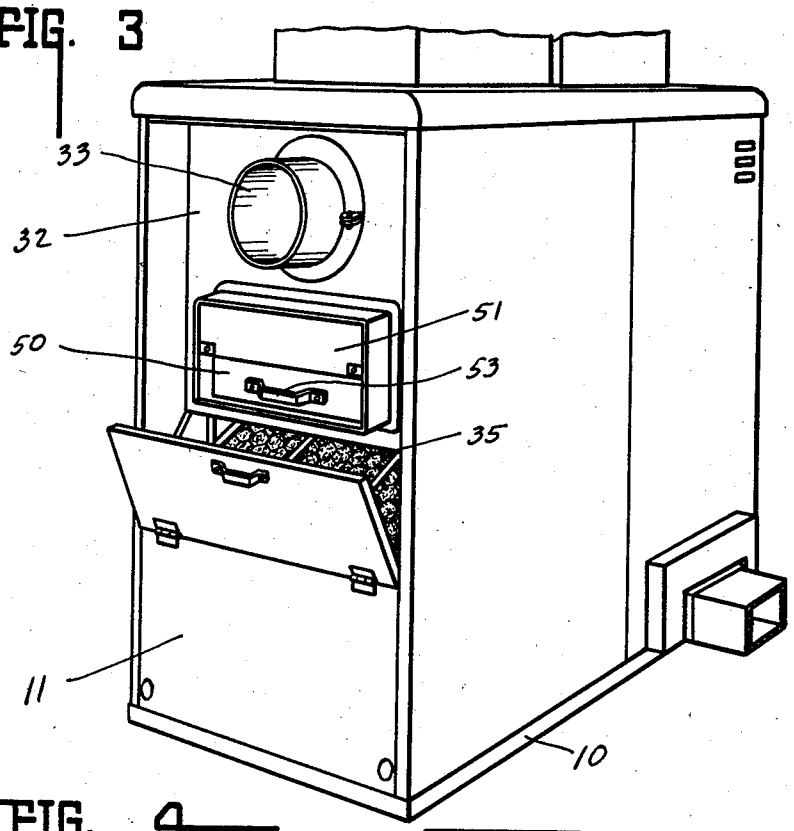
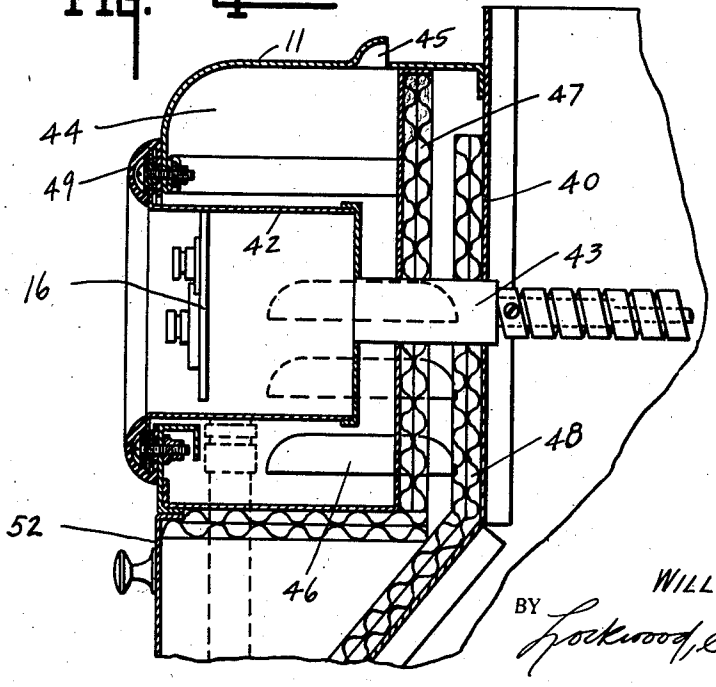


FIG. 4



INVENTOR.
WILLIAM B. SHIMER.
BY Lockwood, Goldsmith & Galt.
ATTORNEYS.

July 22, 1941. W. B. SHIMER 2,250,139

AIR CONDITIONING UNIT

Filed Sept. 20, 1939 4 Sheets-Sheet 4

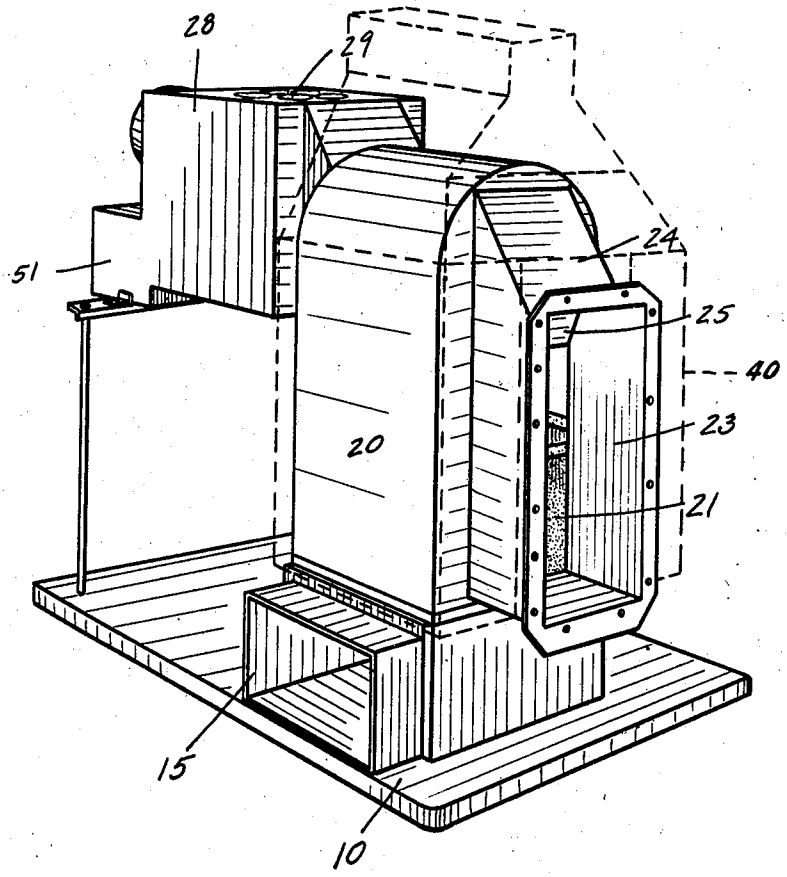


FIG. 9.

INVENTOR.
WILLIAM B. SHIMER.
BY Lockwood, Goldsmith & Galt.
ATTORNEYS.

Patented July 22, 1941 2,250,139

UNITED STATES PATENT OFFICE

2,250,139

AIR CONDITIONING UNIT

William B. Shimer, Indianapolis, Ind., assignor to Schwitzer-Cummins Company, Indianapolis, Ind., a corporation

Application September 20, 1939, Serial No. 295,769

5 Claims. (Cl. 126—114)

This invention relates to an air conditioning unit, and more particularly of the hot air furnace type, wherein air is circulated about a heat exchanger under forced draft, and at the same time is further conditioned through filtering and humidifying. Thus, the air is cleaned, circulated, heated and humidified within the unit.

The principal feature of the invention resides in the structural arrangement of the unit for accomplishing the several purposes above noted in a compact and simplified arrangement and which embodies various improvements and features as hereinafter set forth.

One feature of the invention resides in the provision of a conveniently located and accessible control box and panel mounted immediately above the fire door in the front wall of the enclosing cabinet. The control box contains the several electrical instruments for operating the unit, such as a line switch, stoker switch, time switch, summer switch, fan control and thermostat. The controls therefor are carried in convenient arrangement upon a suitable panel within said box. The control box is so constructed, mounted and insulated with respect to the unit as to be ventilated and shielded against the combustion chamber from the adjacent heat exchanger.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:

Fig. 1 is a perspective view of the unit showing a stoker attached. Fig. 2 is a central vertical section therethrough with parts in elevation. Fig. 3 is a perspective view of the rear wall with parts open and removed. Fig. 4 is an enlarged section through the instrument panel box. Fig. 5 is an enlarged section through the mounting of the instrument box within the unit. Fig. 6 is an enlarged sectional view of the mounting and sealing means for the heat exchange unit. Fig. 7 is an enlarged sectional view through one of the lower fan supporting pads. Fig. 8 is a plan view thereof. Fig. 9 is a perspective view of the base support for the unit.

In the drawing there is illustrated an air conditioning unit receiving its source of heat from the usual stoker fed fire box contained within a combustion chamber. However, the same unit may have its source of heat in the form of the usual oil or gas burner operating within said chamber. In Fig. 1 the unit is shown as comprising a base 10 supporting a cabinet 11. The front face of the cabinet is provided with an ash removing door 12 and fire box door 13. To one side thereof there is shown a stoker unit 14 for feeding fuel into the fire box in the usual manner through a conduit 15 having a removable panel 15a. There is shown similar removable panels on the opposite side and the front at 15b so that the stoker may be applied from either of the three sides. In the same manner an oil burner or gas installation may be applied to the unit through said removable panels. Above the door 13 and adjacent the top of the unit there is shown an instrument panel 16. Also immediately above the fire box portion of the unit there is shown a hot air discharge duct 17 having an automatic humidifier 18 mounted theirein. Cold air is received into the unit through a cold air intake duct 19.

Mounted upon an upstanding frame support carried by the base 10, there is a combustion chamber 20 which in this instance includes a fire box 21 in which there is provided the usual tuyère 22 adapted to receive fuel from the stoker 14 through one of the removable panels 15 in the side wall of the unit.

The combustion chamber is open to the front compartment 23 which is closed by the doors 12 and 13, the roof of the compartment sloping downwardly, as indicated at 24, and being provided with the usual hingedly supported smoke baffle 25. At the bottom of the compartment there is provided a removable clinker bucket 26 having a bail handle 27 into which clinkers may be raked from the fire box and conveniently removed through the ash door 12.

Extending rearwardly from the upper portion of the combustion chamber there is a gas and smoke discharge compartment 28 provided with a series of vertically extending tubes or passageways 29 open at both ends to permit passage therethrough of the incoming cold air from the duct 19 for providing a heat exchanger. Thus, the hot gases are caused to pass about and be baffled by the tubes 29 for highly heating the same to preheat the incoming cold air, after which said gases strike a downwardly-extending baffle plate 30 and pass through a reduced passageway 31 into a conduit 32 and thence out through a smoke pipe 33.

Immediately below the heat exchanger there is provided a horizontally-extending filter pad 34 and an angularly and downwardly-extending filter pad 35 through which the air must pass and be filtered to reach the compartment 36 in which a blower fan, indicated at 37, is mounted. Said fan is driven by a motor 38 to cause the air to be drawn through the filter pads and discharged by the fan under forced draft through a duct 39

into a hot air chamber surrounding the fire box and combustion chamber 20. Such air chamber is enclosed within a shroud 40 spaced from the combustion chamber and enclosed by the cabinet 11, said shroud having its outlet communicating with the hot air duct 17.

From the foregoing it will be noted that the general arrangement and operation of the air conditioning unit is such that heat is generated from any suitable source in the combustion chamber 20 and smoke or gas discharge compartment 28, the cold air being drawn downwardly by the fan through tubes in the latter compartment, filtered and forced into the chamber provided by the shroud 40 surrounding the combustion chamber 20.

Particularly illustrated in Figs. 1 and 4, there is shown the instrument panel 16 mounted over the instrument containing box 42 having a thermal element 43 extending rearwardly therefrom into the hot air chamber through the shroud 40. The box 42 is mounted within a shielding compartment 44, all within the front and top portion of the cabinet 11. Said compartment 44 is ventilated by the louvres 45 and 46 and is surrounded by an insulating wall 47 which in turn is spaced from the insulated wall 48 of the shroud 40. The instrument containing box 42 and its panel 16 is suspended within the compartment 44 so as to be resiliently insulated from its walls by a rubber molding strip 49 which completely surrounds the panel.

For removing fly ash and soot, there is provided a removable pan 50 slidably supported within the clean-out compartment 51 in the rear wall of the cabinet immediately under the smoke pipe 33. Said pan is so designed and positioned that the hot gases which strike the baffle 30 and are thereby directed through a tortuous path, deposit the heavier solids in the pan before passing out through the smoke pipe. Thus, a trap is provided for these solids, most of which may be readily removed by opening the clean-out cover 52 and removing the pan 50 by its handle 53, as well as further cleaning out, if necessary, compartment 51.

As best shown in Fig. 6, the combustion chamber 20 is insulated and sealed about its lower edge from the frame 10 to which it is secured by the bolts 54 through the medium of asbestos pads 55 and the asbestos wick packing 56. Said pads and packing are secured in place by suitable adhesive, such as furnace cement.

The frame 10b supporting the blower 37 is insulated against sound and vibration upon the base 10 by a series of specially constructed rubber pads 57. Said pads are formed with the oval shaped lip 58 which engages over and is embraced by a corresponding opening in the horizontal members of frame 10b. Thus, the pads 57 are located and secured in place by said lip. Each of said pads is provided with an opening 59 to receive lag screws adapted to secure the frame and pads to the base with the pads under slight compression.

The invention claimed is:

1. In an air conditioning unit, the combination with a heat exchanger, air ducts communicating therewith, and a heat source for said exchanger, of a plurality of control instruments therefor, an instrument box mounted in said unit enclosing said instruments, said box being located in the upper more accessible portion of said unit above said heat source, a control panel on said box exposed for convenient manipulation of said instruments, and a shielding compartment having insulated walls surrounding said box in spaced relation thereto for protecting said instruments from said heat source.

2. In an air conditioning unit, the combination with a heat exchanger, air ducts communicating therewith, and a heat source for said exchanger, of a plurality of control instruments therefor, an instrument box mounted in said unit enclosing said instruments, said box being located in the upper more accessible portion of said unit above said heat source, a control panel on said box exposed for convenient manipulation of said instruments, a shielding compartment mounted in said unit surrounding a portion of said box and spaced therefrom, a plurality of ventilating louvres in the exposed walls of said compartment, and insulating walls between said compartment and heat exchanger.

3. In an air conditioning unit, the combination with a heat exchanger, air ducts communicating therewith, and a heat source for said exchanger, of a plurality of control instruments therefor, an instrument box mounted in said unit enclosing said instruments, said box being located in the upper more accessible portion of said unit above said heat source, a control panel on said box exposed for convenient manipulation of said instruments, an insulating molding surrounding the exposed face of said box and extending between said box and the front wall of said unit for supporting said box thereon in insulated spaced relation, and an insulated protective wall extending between said box and heat exchanger in spaced relation thereto to provide a shielding compartment for said box.

4. In an air conditioning unit, the combination with a heat exchanger, air ducts communicating therewith, and a heat source for said exchanger, of a plurality of control instruments therefor, an instrument box mounted in said unit enclosing said instruments, said box being located in the upper more accessible portion of said unit above said heat source, a control panel on said box exposed for convenient manipulation of said instruments, an insulating molding surrounding the exposed face of said box and extending between said box and the front wall of said unit for supporting said box thereon in insulated spaced relation, an insulated protective wall extending between said box and heat exchanger in spaced relation thereto to provide a shielding compartment for said box, and a series of ventilating louvres in the exposed walls of said unit adjacent said box and communicating with said compartment.

5. In an air conditioning unit, the combination with a heat exchanger, air ducts communicating therewith, and a heat source for said exchanger, of a plurality of control instruments therefor, an instrument box mounted in said unit enclosing said instruments, said box being located in the upper more accessible portion of said unit above said heat source, a control panel on said box exposed for convenient manipulation of said instruments, and means surrounding said box and panel within said unit for insulating it from said heat source.

WILLIAM B. SHIMER.