Oct. 14, 1958 H. C. EDWARDS 2,855,874

DRAFT CONTROL ASSEMBLY

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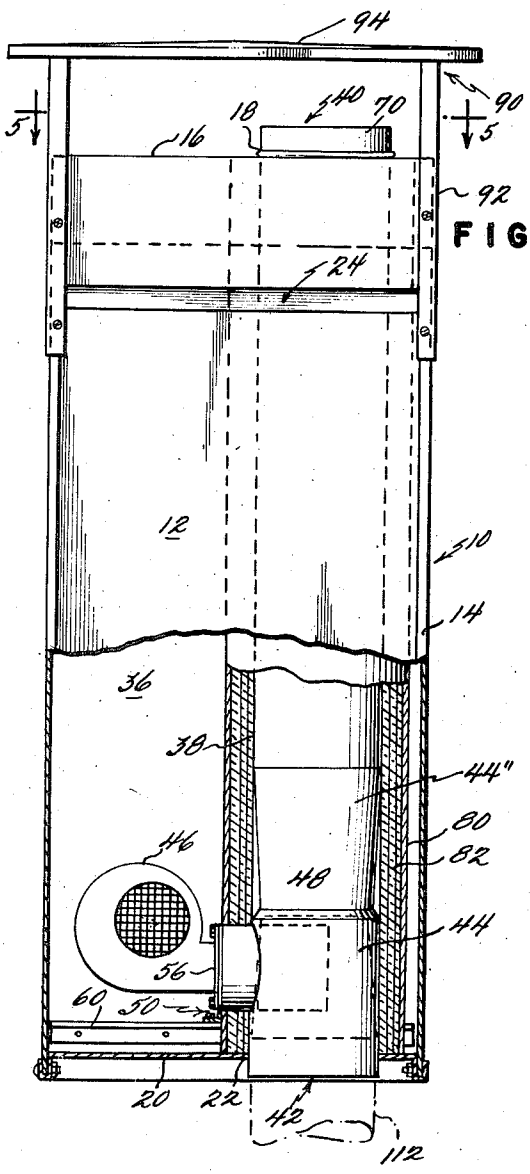


FIG. 1.

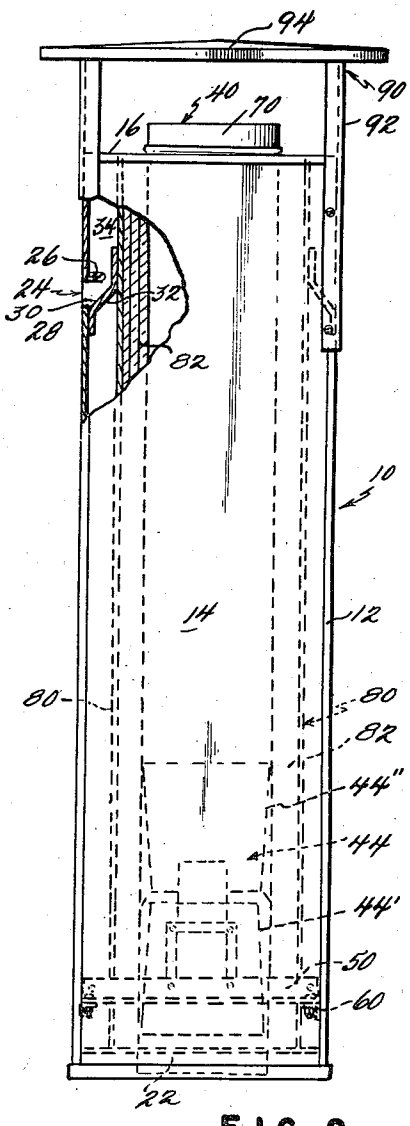


FIG. 2.

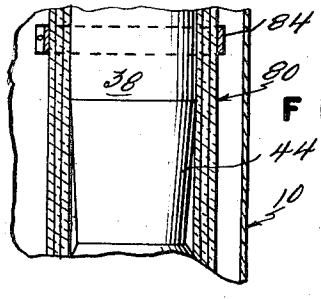


FIG. 3.

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FIG. 4.

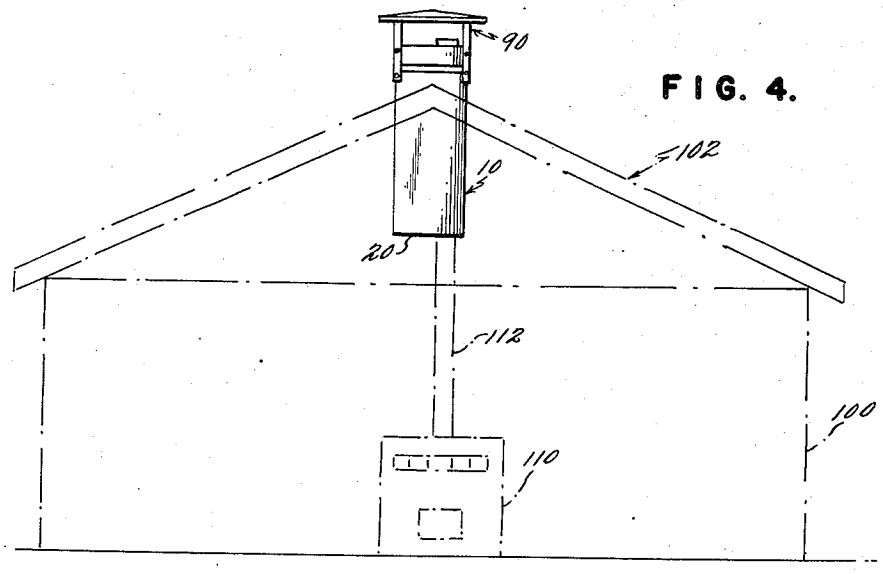


FIG. 5.

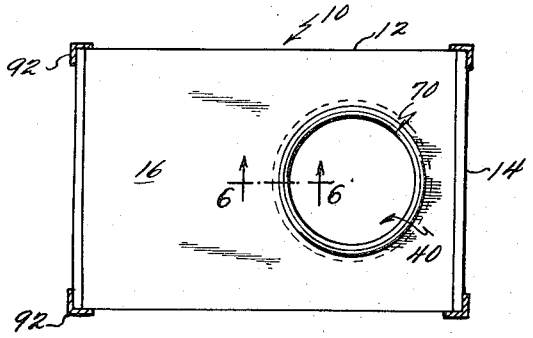


FIG. 6.

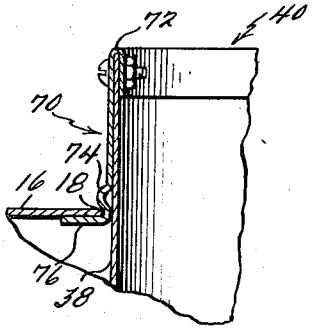
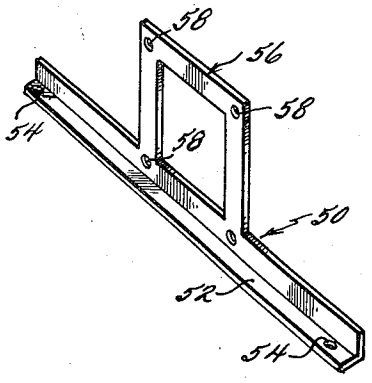


FIG. 7.



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DRAFT CONTROL ASSEMBLY

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Application June 30, 1954, Serial No. 440,349

2 Claims. (Cl. 110—160)

The present invention relates to chimney assemblies for use in the draft of gases of combustion from heated structures such as housing, manufacturing plants, offices and the like. More specifically, the invention relates to an assembly which is adapted to form the exhaust portion of a chimney with a particular function of augmenting the flow of gases of combustion therefrom. The assembly construction is specifically adapted to buildings in which there is little or no insulation between exterior and interior walls or between roof and ceilings; moreover, the invention is designed to facilitate heating in low silhouette constructions such as modern rambler houses and the like. Nevertheless, the invention may be adapted to existing chimney constructions as an integral extension thereof.

Broadly, the invention may be defined as an assembly comprising a simulated chimney element closed at ends and in which is housed a chimney pipe, a portion of which mounts draft inducer means, integrally connected to the chimney pipe. Disposed between the chimney pipe and the housing, suitable insulating means may be provided, the housing moreover having means for the intake of fresh air to feed the draft inducer and chimney pipe.

The present invention is specifically designed as a system to incorporate draft inducing apparatus embodying the principles of construction set forth in my United States Patent No. 2,722,372, issued November 1, 1955. It has been found through experience however, that such a device as that covered previously by the identified patent could not satisfactorily perform the functions required of a draft inducer in low silhouette buildings in which there is little or no insulation between exterior and interior walls. Draft inducers that are operated within a building consume the heated atmosphere of the building and thereby cause obvious inefficiency. Moreover, it has been found by experiment that it is a far simpler and more efficient matter, to seek to draw gases of combustion than it is to force such gases through a chimney pipe. The theory underlying this phenomenon being that in pulling gases, one does not have to displace atmospheric pressure in the form of a column within the chimney pipe. Thus, the more proximate a draft inducer may be to the exhaust portion of a chimney pipe, the more efficient shall be its functioning. The disposition of a draft inducer of the type herein defined, proximate to the exhaust portion of a chimney of a domestic residence, presents unusual problems in the art. For instance, the chimney itself if prefabricated, must be so constructed that the pipe and its supports, shall not have contact with any portion of the building construction per se. It is difficult to get safety approval if careful attention to insulation properties and the like of such devices is not given. With this in mind, the inventor conceived a novel assembly suitable for low cost housing and in which the assembly may be readily fabricated and located within the house, and in which the simplicity

and facility of maintenance and operation is inherent in the very structure of the device.

It is therefore an object of this invention to provide a novel assembly for use in combination with a chimney of an existing house wherein means are provided for augmenting the draft of a chimney to render operation of a heating unit of the house more efficient.

Another object of invention is to create a unitary draft inducing construction kit which is adapted to utilize fresh air from outside homes or similar dwellings, including factories, apartments and the like, the construction facilitating in removal of gases of combustion, dust and the like, thus removing danger from smothering of static fumes by cold air down-draft.

A further object of the invention is to provide means for maintaining the exhaust portion of a chimney having a draft inducer free of dangerous temperatures.

A further object of this invention is to provide a chimney assembly for use in combination with a heating unit and a chimney of a building construction in which the means provided for augmenting the draft of a chimney is contained within the building proximate to the exhaust portion of the chimney and wherein the draft inducer is in direct connection with outside atmosphere.

Still a further object of the invention is to provide an assembly for augmenting the draft of a heating unit chimney in which draft inducing means serves the secondary function of maintaining the components of the assembly free of excessive heat.

Referring to the drawings:

Fig. 1 shows a view in side elevation of the preferred chimney assembly, a portion thereof being broken away to reveal draft inducing means of the type described in Patent 2,722,372 and connected supporting and insulating elements;

Fig. 2 is a side elevation view of the chimney assembly in which a portion of the figure is broken away to reveal the structure of the intake portion of the housing and its associated draft inducer element;

Fig. 3 is a fragmentary elevation of a modified means for securing the insulating material to the chimney proper;

Fig. 4 is a side elevational view of a domestic building containing the preferred chimney assembly construction;

Fig. 5 is a top view of the assembly taken along the lines 5—5 of Fig. 1;

Fig. 6 is a vertical sectional view taken along the line 6—6 of Fig. 5, showing means for securing the terminal portion or exhaust portion of the chimney pipe to the top of the chimney assembly;

Fig. 7 is a view in perspective of means for securing a blower of the draft inducing device to the draft inducing portion of the chimney pipe.

The device shown in Fig. 1 is a preferred form of construction. Here the construction consists of a housing **10** having upright wall portions **12** and **14** forming a simulated rectangular chimney construction. The chimney assembly has a top panel **16** in which there is formed an orifice **18** for the introduction and retention of the exhaust portion of a chimney pipe as shown. The bottom of the chimney construction consists in a related panel **20** having an aperture **22** formed therein to receive the lower end portion of the chimney pipe of this assembly.

Proximate to the top panel there is provided a channel **24**, preferably extending transversely across at least two of the walls **12** of the simulated housing **10**. The upper portion of the channel is defined by the folded flange **26** of the chimney construction and the lower portion is defined by an end portion **28** of the wall **12**. As best shown in Fig. 2, a weather baffle **30** is adapted to engage wall **12** at **28** by welding or other suitbale means. It will be noted that the baffle is bent as at **32** so that the baffle

forms a section which is substantially parallel to the wall of the chimney construction thereby to obviate the possibility of the intake of undesirable elements, such as snow, rain and the like. Intake aperture **34** is defined by the vertically projecting portions of the baffle **30**.

The interior of the housing is indicated as at **36** of Fig. 1, and it will be seen from this figure that the chimney pipe **38** is secured within the housing at the top and bottom thereof. For instance, chimney pipe **38** has exhaust portions **40** and intake portions **42**, each said portion being received by apertures **18** and **22** respectively on the top cover **16** and bottom cover **20** of the housing. Other suitable means are provided for retaining the chimney pipe **38** rigidly in connection with the housing.

As an integral portion of the chimney pipe **38**, a draft inducer **44** is provided. This inducer consists in a device substantially similar to that defined in the co-pending patent application to which I have referred herein. For instance, the inducer assembly comprises a lower converging intake cone or compressing member **44'** and adjacent expansion nozzle member **44''**, the latter being coaxial of the former and spaced therefrom longitudinally to define a peripheral slot opening into the interior of the assembly and having connection with the exterior thereof by way of a suitable plenum chamber, all as defined in Patent 2,722,372.

In this particular assembly, however, it will be noted that the draft inducer forms an integral portion of the chimney pipe. Moreover, the means joining the blower attachment **44** to the chimney pipe is modified over that previously defined in my Patent No. 2,722,372. For instance, a spacer portion **48** of the plenum chamber defines a template for securing of the blower to the plenum chamber of the draft inducer **44**. The blower must be spaced sufficiently apart from the draft inducer so that heat shall not be transmitted to the elements of the blower. The spacing of the blower and related elements from the chimney pipe provides proper insulation of the chimney pipe throughout the entire longitudinal area. To secure the blower **46** to the chimney pipe **38**, an adaptor is attached. Referring now to Fig. 7, the adaptor **50** is depicted to consist in an angle bracket **52** having a plurality of suitably located apertures **54** stamped therein for engagement by securing means connecting the bracket to corresponding transversely extending support members **60**. Adaptor **50** comprises also a template **56** in which there are cut a plurality of apertures **58** through which securing studs or bolts may be passed for engagement with the spacer extension **48** of the draft inducer, see Fig. 1. The adaptor **50** is secured to brackets **60** as best shown in Fig. 2. In the attachment of the blower **46** to the draft inducer, it is preferred that a plurality of bolts having oversized bolt heads be employed. With the use of such bolt heads, cooling thereof is enhanced, since the flow of fresh air within the general chamber **36** passes said fresh air about the elements.

Referring now to Figs. 5 and 6 of the drawings, there appear means for securing the exhaust portion of the chimney pipe to the top of the simulated chimney housing **10**. A retaining member **70** is adapted to engage the outlet of the chimney pipe **38** as at **72**, said retaining member being bent upon itself and secured to the uppermost portion of the chimney pipe **38** as shown. Other suitable means for holding the retaining member **70** to the outlet rim of the chimney pipe may be provided. In this instance, however, retaining member **70** has a peripheral bead **74** passing circumferentially below the point of contact of the retainer, with the uppermost portion of the chimney **38**. This bead serves to support the chimney pipe against downward gravitational movement, said bead engaging the shoulder formed by the rim of aperture **18** of top cover member **16**. Flange **76** extends at right-angles to the vertical disposition of the retaining member **70**. This flange is held contiguous to the inside portion of the top cover member **16** to provide the exhaust portion of the chimney with relatively weather-tight retaining means.

Referring now again to Figs. 1, 2 and 3, the chimney pipe is shown to have an insulating cover therefor, said cover being formed primarily of laminated insulating materials. The insulating cover **82** is held against the chimney pipe **38** as by a retaining sheath **80**. Other suitable means such as a mesh, a tube having fins or separate straps **84** of Fig. 3 may be employed. It has been noted, however, that the most efficient insulator retaining device is one in which a cylindrical sheath **80** is employed to retain the laminated insulating material against the chimney pipe **38**. Such a retaining member as the sheath **80** serves additionally to reflect the heat of gases of combustion back into the chimney pipe structure **38**. Thus enhancing by thermal updraft, the flow of the gases out of the chimney. Moreover, the coolant effect of the flow of fresh air over such a retaining member as sheath **80** is more predominant than in the modification shown in Fig. 3. The chimney may be provided with a spark arrester **90**, comprising for instance a spark arrester plate **94** with supporting legs **92** fastened to the side walls of the housing **10**.

The draft inducer **44** shown herein may be employed with or without a blower **46**. Experiments and employment in the field for purposes of obtaining safety approval and the like have demonstrated upon operation a remarkable decrease in temperature between pipe sections below and those above the draft inducer where no blower unit per se is used. Converging intake cone **44'** and adjacent expansion nozzle **44''** of the draft inducer serve to lead a cool atmospheric flow around the cone for convergent exhaust to the expansion nozzle member. The co-mingling of the atmospheric flow with the gases of combustion in the manner aforesaid causes a substantial convergence of the gases of combustion within the pipe **38** and together with the flow about the exterior of the pipe to disrupt static heat, the resultant may be realized in a cooler chimney section proximate the roof construction of a building.

The adaptation of a preferred form of this device to a building is illustrated in Fig. 4 wherein building **100** having roof **102** is serviced by a heating unit **110**. Chimney pipe **112** engages the housing **10** through bottom portion **20**. The invention as shown is particularly well adapted to low-cost constructions having little or no insulation except exterior walls, sheating and interior walls and ceilings.

Whereas the invention has been described with particular reference to specific embodiments thereof, it will be appreciated that various changes may be made in the constructions shown and described without departing from the spirit of the invention as defined in the appended claims. The invention consists primarily in the conception of a chimney assembly which is adapted to be used in combination with conventional heating units in modern new buildings and which may also supplant existing inefficient chimney constructions, normally engaging attic and roof portions of buildings.

I claim:

1. A forced draft assembly for installation in the vicinity of the exhaust extremity of chimney constructions and the like, comprising in combination: a vertical housing having top and bottom panels adjacent extremities of the housing, said housing being ventilable to the atmosphere; a chimney pipe section passing through apertures of top and bottom panels; at least one portion of the pipe section including in integral association therewith a draft inducer of interior venturi configuration wherein said draft inducer includes a converging compression intake cone and adjacent expansion exhaust cone coaxial of the intake cone and spaced therefrom to define a peripheral opening at the converging end of the intake cone, means connecting said opening with the in-

terior of the housing; forced draft means connected to said connecting means, whereby said assembly provides a partial vacuum to the interior of the chimney pipe section and products of combustion and the like rising in the chimney pipe are inducted to flow into said section, converged and forcibly dispelled from the interior of the assembly.

2. The assembly according to claim 1 in which said chimney pipe section carries a sheath of heat reflecting inner surface whereby heat radiated from the pipe section to said sheath is reflected back to said pipe.

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