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J. VALENSI

2,659,293

CHIMNEY STACK, ESPECIALLY FOR LAND VEHICLES AND SHIPS

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Fig. 1

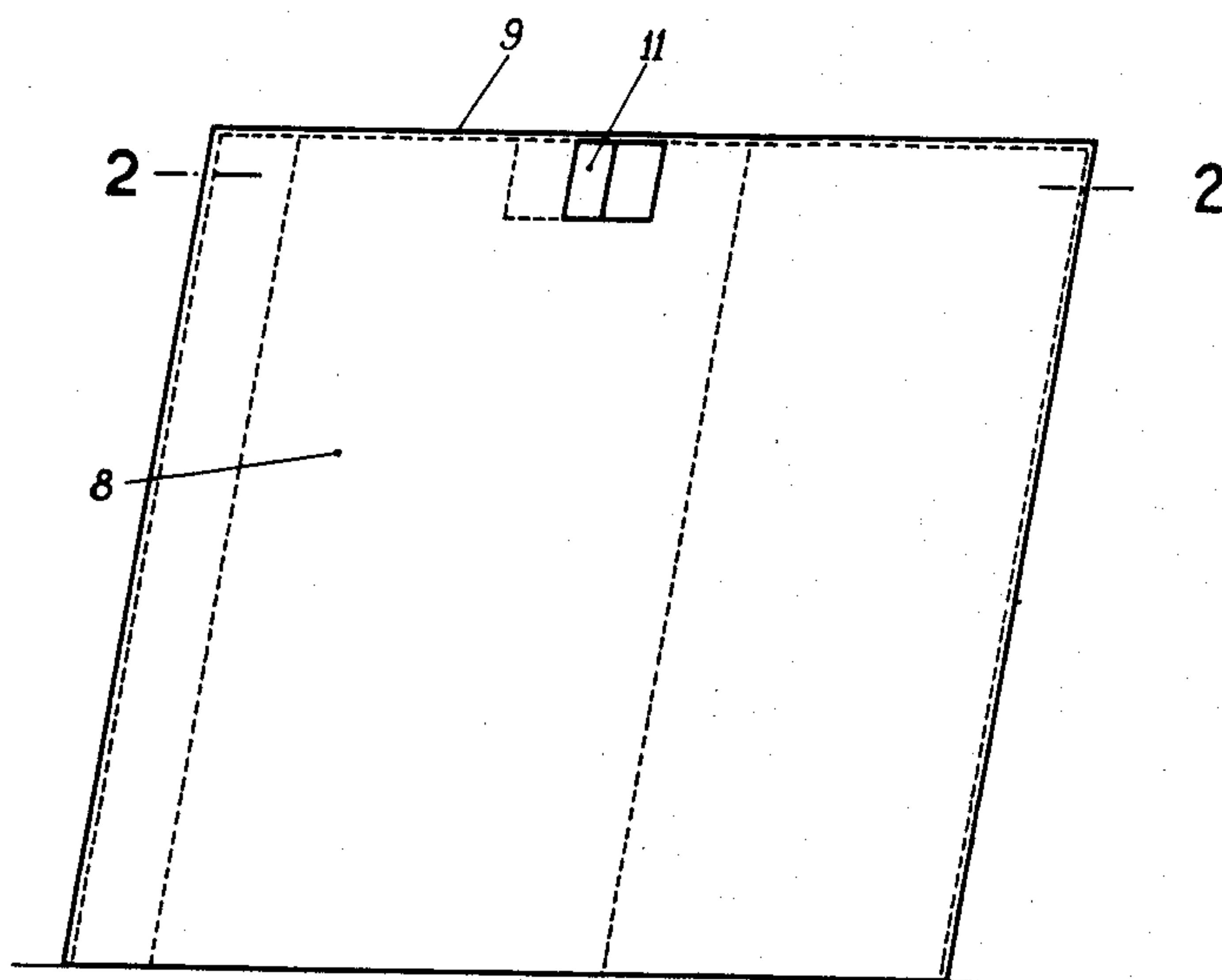
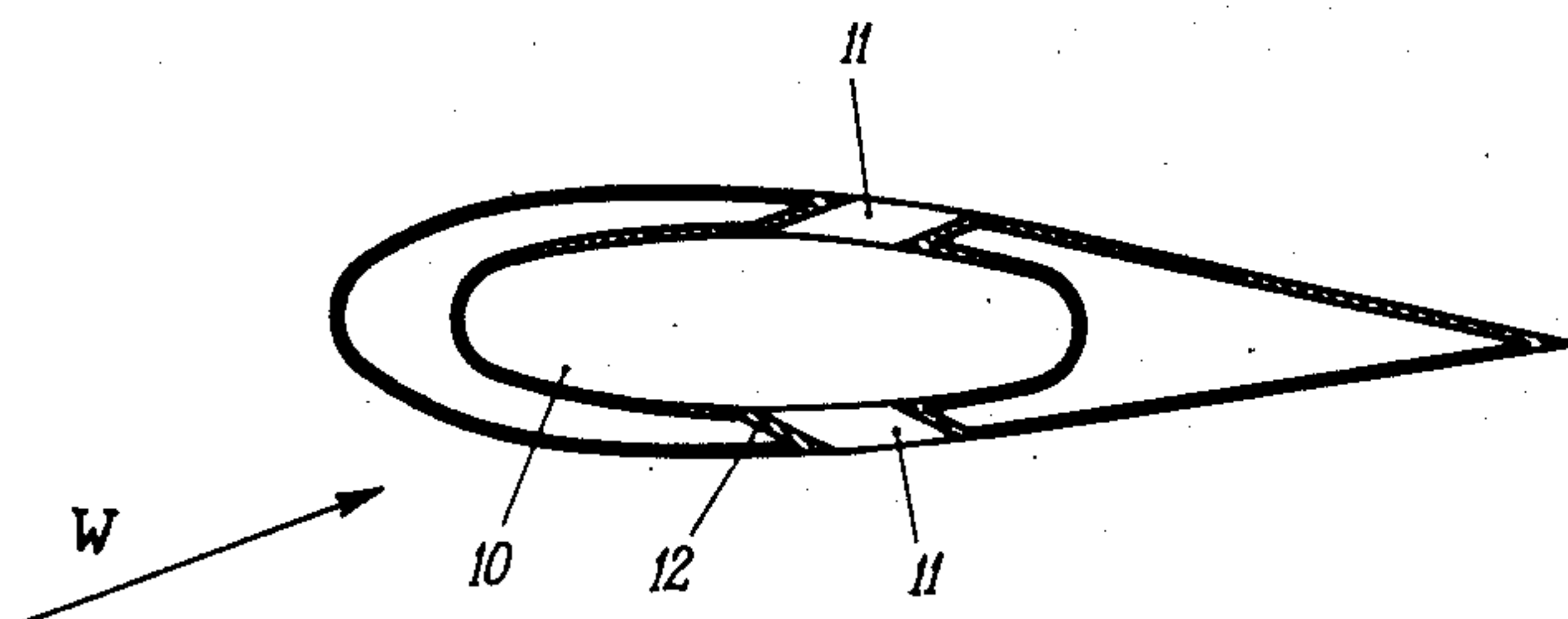


Fig. 2



INVENTOR  
JACQUES VALENSI

By  
Wendroth, Lind and Pomeroy  
ATTORNEYS

## UNITED STATES PATENT OFFICE

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CHIMNEY STACK, ESPECIALLY FOR LAND  
VEHICLES AND SHIPS

Jacques Valensi, Marseille, France, assignor of  
one-half to "Société Anonyme des Forges et  
Chantiers de la Méditerranée," Paris, France, a  
corporation of France

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Claims priority, application France  
November 17, 1948

3 Claims. (Cl. 98—60)

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This invention relates to chimney-stacks, especially for vehicles and ships, of the type described in my co-pending U. S. application Ser. No. 7,933 filed February 12, 1948, now Patent No. 2,610,570, for smoke stacks in particular for land vehicles and ships, and it is a general object hereof to provide certain modifications and improvements in and to chimney-stack structures of the kind specified.

In my said co-pending application, I have described a chimney stack construction for vehicles, comprising a flue and a surrounding fairing structure, so formed and related that in operation there will be created a so-called "wing-tip vortex" extending from a point of the fairing adjacent the flue outlet in the direction of the relative wind and effective to channelize and lead away the smoke jet issuing from the flue, thus preventing said smoke from becoming objectionably beaten down in the immediate vicinity of the chimney.

Various embodiments were shown and described in said co-pending application, in which said fairing structure is in the form of an upstanding aircraft wing of biconvex symmetrical horizontal contour, adapted to generate, in relative wind conditions, a highly concentrated wing-tip vortex, and the flue outlet opens into the centre of said vortex. Various auxiliary means were also described in and illustrated effective to enhance the formation and effectiveness of the wing-tip vortex.

It is an object of the present invention to provide a chimney-stack having the advantages described at length in the said co-pending application, while being simpler to construct and retaining to a greater degree the usual aspect of conventional chimney-stacks and ship-funnels, as compared to any of the embodiments specifically illustrated in said prior application.

A further object is to provide an improved smoke-stack comprising in combination a flue, a fixed fairing surrounding the flue which is in the form of an upstanding aircraft wing having a biconvex symmetrical horizontal contour in a closed flat top, the maximum transverse chord of the horizontal cross-section of the fairing being at about 20% of the horizontal axis from the leading edge and outlet ducts connecting the flue at the very upper edge of the fairing with each opposite side of the fairing, these outlet ducts directed rearwardly from the flue at an angle of about 30° to the fairing surface.

In the accompanying drawings,

Fig. 1 is a side elevation of an improved chim-

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ney-stack or funnel according to this invention, while

Fig. 2 is a horizontal section thereof on line 2—2 of Fig. 1.

As shown, the funnel comprises an outer fairing structure 8 in the general form of a cylinder. While the front and rear edges of the fairing are shown as provided with a certain degree of rearward rake, it will be understood, in accordance with the teachings of my above-mentioned co-pending application, that said edges could be made vertical, or that only the leading edge might be raked while the trailing edge is vertical. In horizontal cross-section the fairing 8 presents the form of an airfoil contour or aircraft wing wherein the maximum transverse chord is preferably in the ratio of about 20% in length of the longitudinal dimension of the section, all as in the co-pending application.

According to a feature of the present invention, the top 9 of the fairing is flat and horizontal, and is completely closed. The smoke flue 10 opens outwardly through a pair of outlets 11 substantially square in cross-section formed in the sides of the fairing adjacent to the flat top 9, preferably slightly forward of the midpoint of the longitudinal dimensions of the fairing. The vertical sides 12 of the outlets are directed rearwardly as shown, forming an angle of about 30° with the outer surface of the fairing sides.

It is found that with this construction, a satisfactory guiding effect is obtained for the smoke jet, however high the rate of discharge thereof from the flue outlets may be, and for a wide range of incidence angles, that is, for a range of angles formed between the relative wind and the direction of travel of the vehicle, between about 0 and 30°.

When the ship is in motion, assuming the direction of the wind prevailing at any given time is such that its velocity will combine with the ship's velocity to give a resultant directed as indicated by the arrow W (i. e. a port wind), then a wing-tip vortex is created at the top of the funnel, said vortex extending from a point substantially midway of the longitudinal extent of the funnel and away from the funnel in the direction of the relative wind W. The smoke will then be discharged out of the starboard outlet 11 into the core of this vortex and in a spiral or helix surrounding said core, so that it will be efficiently guided away from the funnel.

If on the other hand, the direction of the wind were such as to give a starboard rather than a port relative wind resultant, then the wing-tip



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vortex will extend from the port side of the funnel and the smoke will issue out of the port outlet 11.

At the same time, it will be seen that on account of the flat top, the structure shown herein is simpler to construct than the forms shown in the above-mentioned prior application, and is more conservative in appearance, since, as seen from a distance, it resembles more closely a conventional ship funnel.

It will be understood that modifications may be made in the specific construction illustrated herein without exceeding the scope of the appended claims. In particular, any of the auxiliary devices taught in the parent application to enhance the effectiveness of the wing-tip vortex, such as baffles, flaps, slotted means, etc., illustrated and or described in said prior application, may of course be used in connection with the structure shown herein.

What I claim is:

1. In a smoke-stack of the type described, in combination, a flue, a fixed fairing surrounding said flue, said fairing being in the form of an upstanding aircraft wing having a biconvex symmetrical horizontal contour and a closed flat top, said fairing being symmetrically biconvex in horizontal cross-section with its maximum transverse chord at about 20% of the longitudinal axis from the leading edge, and outlet ducts 30

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positioned at the very upper edge of the fairing connecting said flue at the top edge thereof with each opposite side of said fairing, said outlet ducts being directed rearwardly from said flue at an angle of about 30° to the fairing surface and terminating in outlet apertures in said fairing side surfaces.

2. A smoke-stack arrangement as in claim 1 wherein said flue outlets open forward of the midpoint of the longitudinal chord of said fairing structure.

3. A smoke-stack arrangement as in claim 2 wherein said flue outlets are substantially square in cross-section.

JACQUES VALENSI.

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