Jan. 16, 1962 E. I. WAGNER 3,017,146

JET ENGINE BLAST FENCE

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Fig. 1.

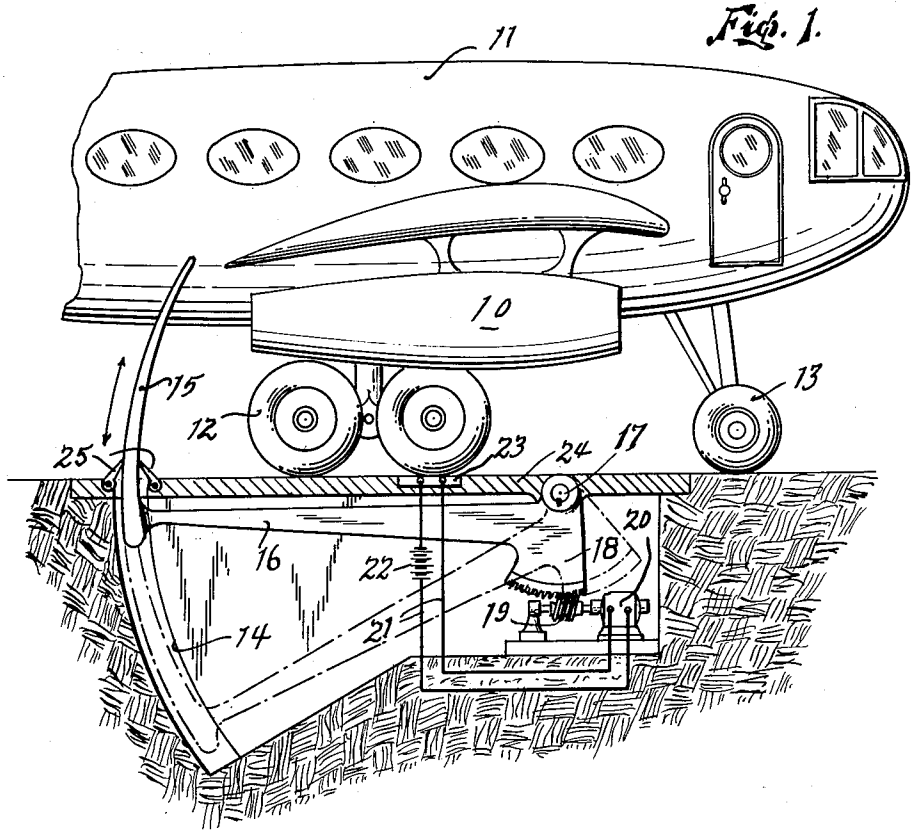
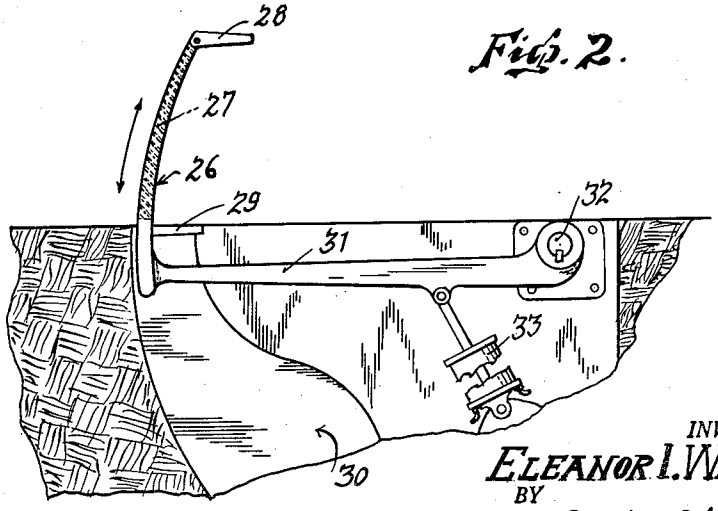



Fig. 2.



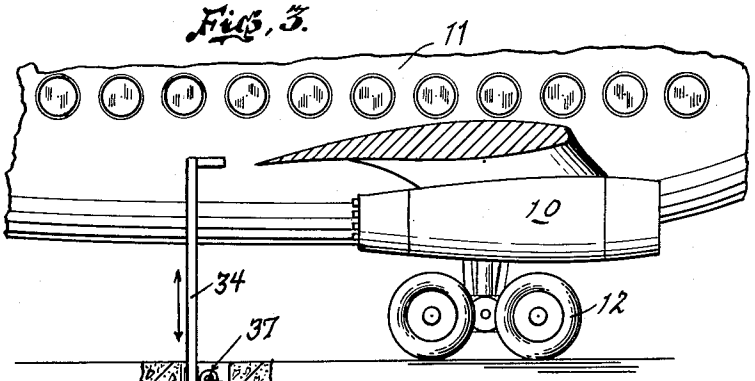

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Fig. 3.



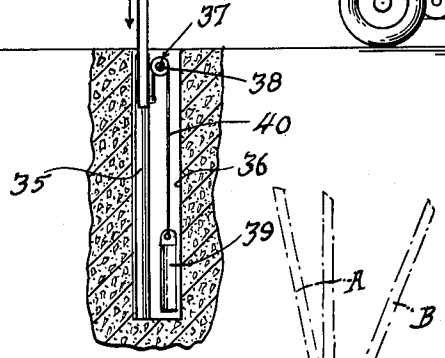
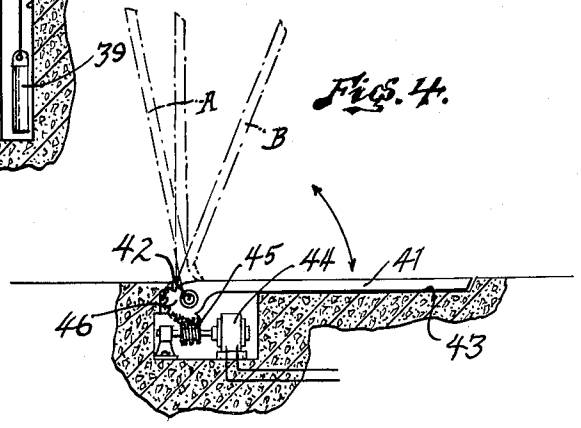




Fig. 4.



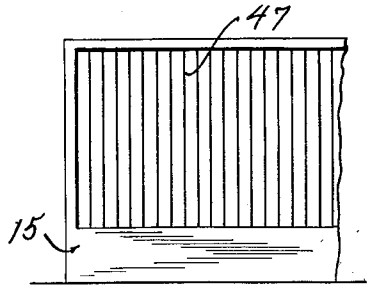




Fig. 5.

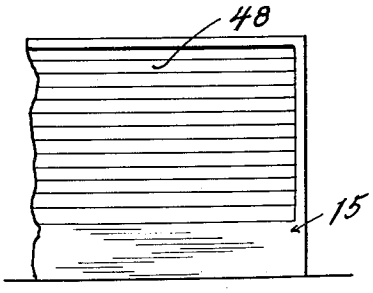



Fig. 6.

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# JET ENGINE BLAST FENCE

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4 Claims. (Cl. 244—114)

My present invention relates to airport facilities and more particularly to a blast fence for airports in connection wth the operation of jet-propelled aircraft.

An object of the invention is to provide a blast fence for intercepting the propelling gases that are discharged at a high velocity from the jet engines during the warming-up and take-off periods.

Another object is to provide a blast intercepting fence which may be installed and operated at various points of an airport or upon take-off runways without interfering with the passing of airplanes in the vicinity or over the surface where the jet fence might normally be used.

A further object of the invention is to provide a blast fence for use on airport service areas and/or at points of take-off on a runway which is adapted and arranged to be concealed in a pit or slot extending below the surface of the runway when not in use.

Other objects and advantages of the invention will be in part evident to those skilled in the art and pointed out hereinafter in the following description taken in connection with the accompanying drawings wherein there is shown by way of illustration and not of limitation preferred embodiments of the invention.

In the drawing;

FIGURE 1 is a fragmentary side view partially in section and showing one form which the invention may take.

FIGURE 2 is a smaller fragmentary view showing a modified form of mounting for a blast fence.

FIGURE 3 is also a fragmentary view showing another blast fence constructed and operated in accordance with my invention.

FIGURE 4 is a fragmentary sectional view showing a further form which the invention may take, and

FIGURES 5 and 6 are fragmentary views showing additional details of construction.

Basically my invention resides in the provision of a blast fence that may be installed on an airport at points where a permanent or fixed fence would be impractical. While the idea of a blast fence as a means for intercepting the blast of hot gasses from a jet engine is not entirely new, so far as I have been able to determine these prior blast fences are installed as a fixed and permanent structure in outlying warm-up areas or at the service hangers far removed from the normal paths of aircraft travel at the airport.

The purpose of these so-called blast fences is to intercept or redirect or deflect the discharge of hot gases which in the absence of such a fence would pick up and propel dust and other debris over the airport for a considerable distance and also render it difficult for passengers to pass to and from the airport facility to the jet-propelled plane. In addition to these objections there is also the fact that when uncontrolled these blasts of hot gases often set up clouds of dust which is detrimental as any dust in the air at the intake of the jet engine may result in damage to the internal mechanism of the engine. While it is feasible and practical to maneuver a jet-propelled aircraft into position where the blast of the jet engines will be positioned a proper distance from a fixed blast fence, this operation is time consuming and expensive as it may entail delays, which are costly in the operation of jet-propelled aircraft. With my invention it is possible to locate a blast fence at any point upon an airport where desired and particularly at the point of takeoff and loading areas



of the airport where the installation of an immovable blast fence would be impractical.

In FIGURE 1 of the accompanying drawings, my invention is shown as associated with a jet engine, designated by numeral **10** of an aircraft **11**. The aircraft **11** has the usual landing gear comprising a bogie **12** and a forward landing wheel **13**. In this showing the airport has a pit or slot **14**, extending laterally with respect to the direction of travel of an aircraft, and movably supported in the slot **14**, there is a baffle or fence forming member **15**, which in this arrangement is carried by two spaced lever arms **16**, one at each end thereof, that are pivotally mounted upon a concealed laterally extending shaft **17**. The lever arms **16** are here shown as having an arcuate gear, sector **18**, that engages with a worm gear **19**, driven by an electric motor **20**. The motor **20** has a control circuit **21** having a source of power **22** that is adapted to be opened and closed by a control switch **23**, here shown as operated by one of the wheels of the bogie **12** of the aircraft **11**. In the preferred arrangement the levers **16** are concealed in right-angle extensions of the pit **14** and over these extensions, there is a surface plate or platform upon which the shaft **17** is journaled. One of the lever arms **16** is shown here as keyed to the shaft **17** and at its other end, the shaft **17** carries a similar lever arm **16** from which the worm gear **19** is omitted. From this it will be seen that when the motor **20** is operating in one direction, these lever arms **16** will move in unison and cause the blast-intercepting fence **15** to be lowered from the position here shown and into the pit **14** where it will present no interference with the movement of an aircraft over this particular area of the airport. When the electric motor is operated in a reverse direction, the lever arms **16** at the ends of the shaft **17** will operate to raise the blast intercepting fence from the pit **14** and into a position where it, as at the time of the takeoff or during a warming-up period, will intercept or deflect the blast of hot gases emanating from the jet engine **10**. After the aircraft has disengaged the control switch **23**, the fence **15** will return to its inoperative position below the surface of the airport and into its accommodating pit **14**. In order to provide against the accumulation of debris in the pit **14** when the blast fence **15** is in its concealed or inoperative positions or in its exposed operating position, there is shown a pair of hinged covers **25** that close over the slot-like opening of the pit **14** in the surface of the airport.

In the FIGURE 2 of the drawings, there is shown an arrangement of the invention in which a blast fence, designated by the numeral **26**, is provided with horizontally extended louvers **27** and it has a horizontally extending flap **28** along its upper edge that is adapted to form a closure at the top **29** of a pit **30** into which the blast fence **26** is adapted to be concealed when in its inoperative position below the surface of the airport. In this instance, the blast fence **26**, like the blast fence **15**, is arcuate in configuration and is supported at its ends by pivotally mounted levers **31** that pivot about a supporting shaft **32**. In this instance instead of the electric motor **20** and the worm and gear drive, the levers **31** are here shown as operated by a hydraulic cylinder **33** which will be connected through suitable control valves (not shown) with source of fluid under pressure, as will be understood by those skilled in the art. The levers **31** also move in narrow slots that are formed as right angled extensions at the ends of pit **30**.

In FIGURE 3 of the drawings, there is shown an adaption of the invention in which a blast fence, designated by the numeral **34**, is mounted for vertical movement between guide rails **35** that extend vertically into a pit **36** formed in the airport surface. The blast fence

34 is here adapted and arranged to be raised and lowered by the operation of a sheave or sprocket 37 that is driven in one direction or the other by an electric motor (not shown) which is connected with a shaft 38 to which the sheave 37 is keyed. As a means for counter balancing the blast fence 34, there is shown a counter balancing weight 39 that operates over a sheave or sprocket 37 through a cable or chain 40.

In FIGURE 4 of the drawings, there is shown a further modification of the invention in which a blast intercepting fence 41 is shown as hingedly mounted upon a laterally extending shaft 42 so that the blast fence 41 may be raised into an inclined or vertical position as indicated by dot and dash lines A and B when in operation. The blast fence 41, when not in use, rests in a recess 43, formed in the surface of the airport so that when in its inoperative position, the surface of the airport will be uninterrupted. This blast fence 41, like the blast fence 15, is operated by an electric motor 44 which drives worm 45 that meshes with a worm gear sector 46 carried by the blast fence 41. At this point, it should be stated that while the electric motor 20 is shown in FIGURE 1 of the drawings as having a control circuit responsive or sensitive to the position of an aircraft with respect to the blast fence, it is to be understood that the motor circuits may be controlled by push buttons or other means located at any desired remote point of the airport.

As shown in FIGURES 5 and 6 of the drawings, the blast intercepting fences 15, 26, 34, and 41 may be of solid construction or they may be provided with closely spaced louvers 47 or 48 that extend vertically or horizontally as here shown.

When my invention is in operation, it is contemplated that the blast fences will be arranged in pairs in lateral alignment so that one fence of each pair will be raised at each side of the aircraft body. In the event that the aircraft is of the four jet engine type, individual fences with proper spacings for each jet engine may be employed or single fences at each side of the airplane may be constructed of a length that will intercept the blast of two or more jet engines. This may be determined by the type of plane with which the blast fences are to be used.

While I have, for the sake of clearness and in order to disclose my invention so that the same can be readily understood, described and illustrated specific forms and arrangements, I desire to have it understood that this invention is not limited to the specific forms disclosed but may be embodied in other ways that will suggest themselves to persons skilled in the art. It is believed that this invention is new and all such changes as come within the scope of the appended claims are to be considered as part of this invention.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. A disappearing baffle for intercepting and deflecting the blast of hot gases of an aircraft propelling jet engine, comprising a sub-surface structure forming a pit having a transversely extending open slot located in the surface of an airport runway, movable fence-like baffle adapted and arranged to be lowered into and raised from said pit through said open slot below an aircraft supporting surface, a supporting lever arm at each end of said baffle pivotally mounted at a point removed therefrom, each of said pivotally mounted lever arms having a worm gear sector formed thereupon, a worm gear mounted in mesh with said worm gear sector, an electric motor for driving said worm gear, and a control circuit for said electric motor operated by a wheel of an aircraft when the propelling jet of said aircraft is in cooperating relation with said blast intercepting and deflecting baffle.

2. A disappearing baffle for intercepting and deflecting the blast of hot gases of an aircraft propelling jet engine, comprising an airport area having a sub-surface baffle supporting means with a laterally extending open slot, a pivotally mounted fence like baffle adapted and arranged to be lowered into and raised from said laterally extending slot in the airport surface, a supporting lever arm at each end of said baffle pivotally mounted upon said baffle supporting means at a point removed laterally from said slot, said pivotally mounted lever arms being operated by motive power means, and a power controlling means for said motive power means for raising said baffle when the jet of a jet propelled aircraft is in cooperating relation with said blast intercepting and deflecting baffle.

3. In a jet accommodating airport, the combination of an airport with a surface over which a jet propelled aircraft may move, said airport having a pit below said aircraft supporting surface with a open slot through which a disappearing blast fence may move, a disappearing blast intercepting fence forming member mounted upon a laterally disposed pivotal axis within said pit for movement downwardly into a concealed inoperative position within said pit and moveable upwardly about said axis from said pit and into an operative position for intercepting and deflecting the blast of hot gases from an arcraft propelling jet engine, and a motive power means mounted in said pit for moving said fence forming member between its operative and inoperative positions with respect to said blast of hot gases when the aircraft is stationary.

4. A disappearing baffle for intercepting and deflecting the blast of hot gases of an aircraft propelling jet engine, comprising a sub-surface structure forming a pit having a transversely extending open slot located in the surface of an airport, a moveable fence-like baffle pivotally mounted upon an axis within said pit and adapted and arranged to be lowered into and raised from said pit through said slot in the aircraft supporting surface, said axis being located at one side of said slot, a supporting lever arm at each end of said baffle pivotally mounted at their ends for movement about said axis, and hydraulic means operatively connected to said lever arms for raising and lowering said fence-like baffle into and out of said pit.

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