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RETRACTABLE BLAST DEFLECTOR FENCE

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Fig. 1

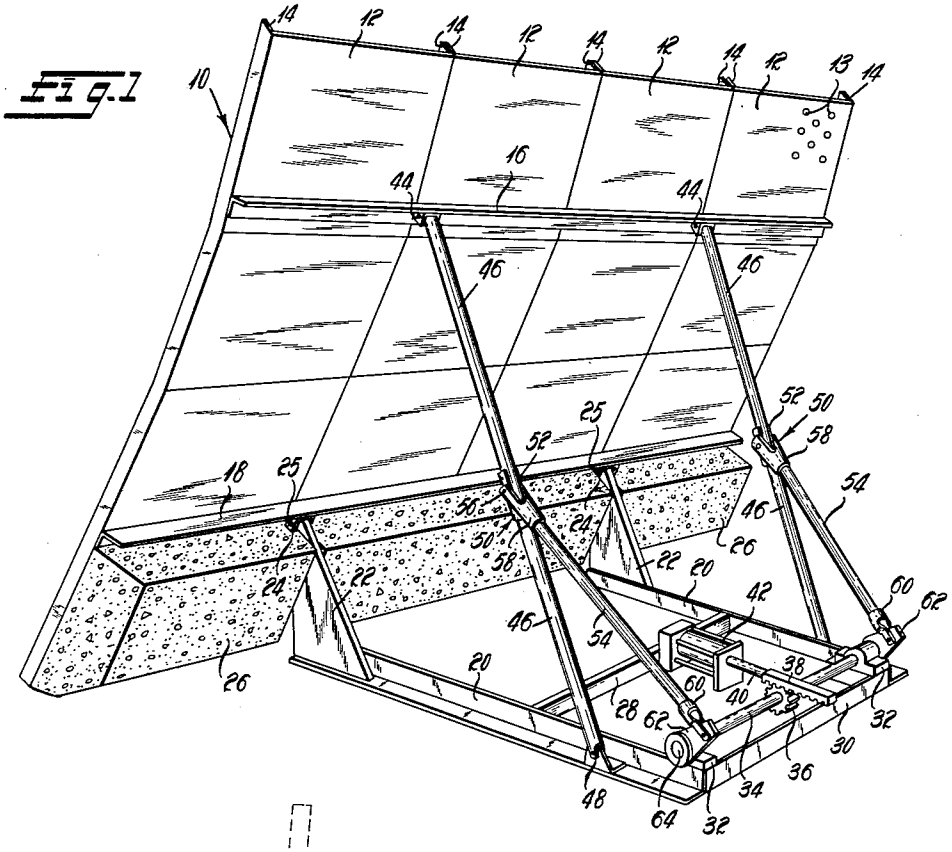
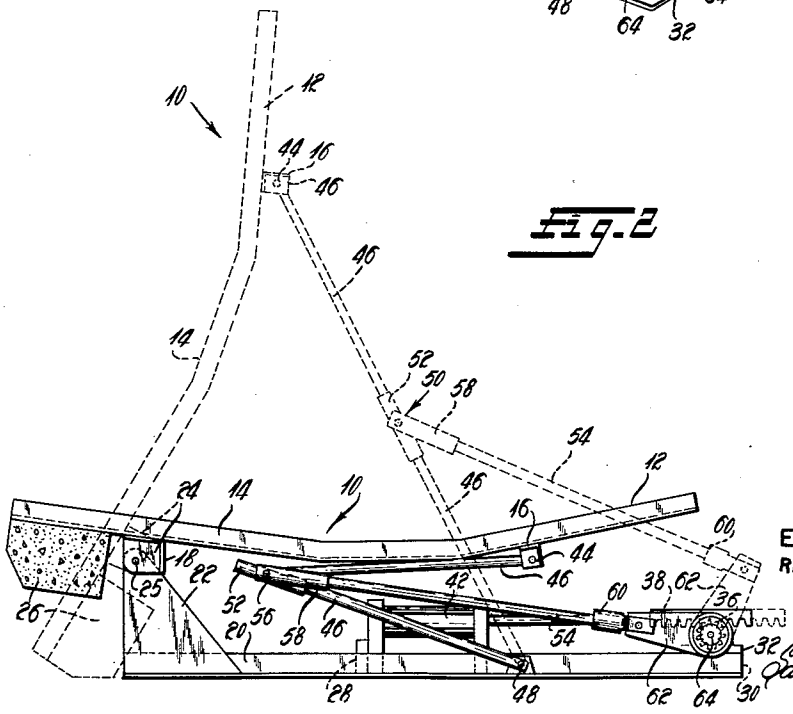


Fig. 2



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RETRACTABLE BLAST DEFLECTOR FENCE

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This invention relates to improvements in blast fences for deflecting the very high temperature, high velocity jets of gas and air exhausted from the nozzles of reaction motors of modern jet aircraft while on an airport apron during warm-up and ground testing of such engine, and at the end of a runway during takeoff. Such exhaust blasts frequently cause hazardous conditions to persons and equipment in the immediate vicinity of the aircraft. Jet engines are vulnerable to dust, dirt, and other objects which may be pulled into their intakes. Thus the blast from one jet engine may cause objectional matter to be hurled toward the intake of another such engine to the detriment of the latter.

It is the object of this invention to provide a perforated or solid blast fence which may be located in and transversely of the path of the exhaust blast from a jet engine, and which, when solid, redirects the blast upwardly and rearwardly over the fence, and which, when perforated will break up the blast and direct some of it upwardly and rearwardly, and some of it through openings in the fence, thereby causing a turbulence behind the fence which will dissipate the force of the blast and allow it to escape harmlessly. The perforated fence is the preferred form because it products a more dissipative action on the blast; however, in the case where additional protection is desired immediately behind the fence, the perforations may be reduced in number and size, or even eliminated completely, depending on the degree of protection required. The dimensions of the fence preferably should be such that the upper edge, when in operative position, will be at a higher level than the path of travel of the blast, so that the entire blast will hit the fence. It should preferably be higher also than the height of persons who may be behind the fence, proceeding to or from an adjacent aircraft.

Such fences, especially those installed at the end of a runway to prevent the blast from planes during takeoff from blowing debris over the airport boundaries onto highways usually running alongside the airport, sometimes interfere with the landing of planes on the runway. It is therefore another object of the invention to provide such a fence having a supporting structure which may be retracted to lower the fence from an upright to a horizontal position as required, especially during the landing of incoming planes.

Other objects and advantages of the invention will appear in the following description thereof.

Referring to the accompanying drawings forming part of this application, and wherein like reference characters indicate like parts:

FIGURE 1 is a perspective view of the rear of a length of blast fence showing the retractable feature of the supporting structure of the fence.

FIGURE 2 is an end elevation of the fence shown in FIGURE 1 with the retracted position shown in solid lines, and the elevated position shown in dotted lines.

In the drawings, the fence **10** is made up of a plurality of modular units **12**, which are rectangular sheets of metal, bent into a slightly arcuate form as shown. Each unit is provided with side flanges **14**, the meeting flanges of adjacent units being secured together in any desired manner so that a fence of any desired length may be provided by merely assembling the desired number of the units together. The units may be perforated as indicated at **13** so

that part of the air blast striking same will be directed upwardly and over the fence and part will pass through the openings and be broken up and dissipated behind the fence. It is not imperative, however, that the units be perforated as previously explained.

An angle iron **16**, or other suitable structural member, is secured across the rear of the units adjacent the top of the fence, and a similar member **18** is secured across the rear of the units adjacent the bottom of the units. These structural members provide added rigidity to the assembled modular units **12**.

A frame structure to support this fence is provided, comprising a pair of angle iron members **20—20** disposed normal to the rear of the fence, spaced inwardly from the sides of the fence and adapted to rest upon the ground when the fence is in use. One of the flanges of said angles extends upwardly, and against this flange of each angle at the end adjacent the fence is secured the lower margin of a triangular plate **22—22**. The apex of each triangular portion **22—22** extends between spaced flanges **24—24** of angle clips secured to angle member **18**, and said apices are pivotally secured on a horizontal axis to said clips as at **25**.

Across the rear lower margins of the modular fence units **12**, immediately below flanges **24—24**, is a substantial concrete or other counterweight indicated at **26**. The bottom surface of the counterweight is chamfered at an angle so as to be in plane with and rest upon the ground when the fence is in upright position. Being of substantial weight and below the pivotal point **25** of the fence to the framework, the counterweight effectively balances the fence across pivot **25** and therefore reduces to a minimum the power required for elevating and lowering the fence and correspondingly reduces to a minimum the sizes of the various elements comprising the elevating and lowering mechanism.

Between the angles **20—20**, about midway between the ends thereof, extends a brace **28** which is secured at its ends to said angles **20—20**. At the outer ends of these base angles **20—20** is a second bracing member **30** extending therebetween and secured at its ends to said base angles. Upon the ends of this second bracing member **30** is a pair of pillow blocks **32—32**, within which are journaled the ends of shaft **34**. Approximately centrally disposed on this shaft is a pinion gear **36** which meshes with a rack **38** on the end of piston shaft **40**, extending within air cylinder **42** to a piston reciprocable therein upon application of a source of compressed air, not shown, thereto. Air cylinder **42** is secured to the brace member **28** to effectively hold it in position with the rack **38** in mesh with pinion **36**. Obviously instead of the air cylinder **42** a motor may be substituted driving a worm gear meshing with pinion **36** and accomplish the same purpose.

Pivotally mounted within clips **44—44**, secured within angle **16**, are the upper ends of brace rods **46—46**, the opposite ends of which are pivoted, as at **48**, to the base angle iron members **20—20**. Intermediate of the ends of the brace rods **46—46** they are each provided with a knuckle joint **50—50**, each arm **46** being in two parts pivotally joined at **50**. The upper ends of the lower part of arms **46** are provided with couplings **52** applied thereto by welding and the upper ends of the coupling are cut away so that the lower ends of the upper part of the arms **46**, pivoted thereto, may jackknife when the fence is retracted as shown in FIG. 2.

For raising and retracting the fence, there are provided push rods **54**, the upper ends of which are pivoted to the knuckle joints **50**, as at **56**, by means of bifurcated sleeves **58**, screw-threadedly applied to the upper ends of said rods **54**. The lower ends of rod **54** are also screw-threadedly applied to bifurcated sleeves **60**, the bifurcated ends of which are pivotally attached to one end of the

crank arms **62**, the other ends of which crank arms are in turn secured to the ends of shaft **34**. The bifurcated sleeves **58** and **60** are shown as screw-threadedly applied to the ends of push rods **54** and which permits a small adjustment in the length of rods **54** within the limits of the screw-threaded portion of the sleeves. However, these sleeves may be rigidly fixed to the ends of the rods **54** if preferred.

Thus when it is desired to retract or lower the fence from operative position as shown in FIG. 1 to retracted or inactive position as shown in full lines in FIG. 2, the motor **42** is started so as to retract rack **38**, which causes the pinion **36** to rotate counterclockwise. This in turn will cause the crank arm **62** to force rods **54** against the knuckle joints **50**, resulting in the knuckles jackknifing and the fence itself rotating on the pivotal points **25** until in the position shown in solid lines in FIG. 2. In this position, if the fence perchance is installed at the end of a runway, there would be no interference with the landing of incoming planes.

From the foregoing it will be seen that we have provided by this invention a blast fence composed of a plurality of identical units which may be retracted out of the way of incoming aircraft and which have counterweights to minimize the size and power required of the retracting mechanism.

We claim:

1. A blast fence for use transversely of an airport runway in deflecting and dissipating the blast from a jet engine, said fence comprising a plurality of modular units secured together at their sides to thereby form a composite fence, a counterweight secured to said fence along the lower margin thereof, means pivotally supporting said fence at an angle to the horizontal, said pivotal support being on a horizontal axis above the counterweight, means comprising joined supporting arms for moving said fence on its pivotal support, and means for folding said arms and thereby retracting said fence on its pivotal support toward horizontal position.

2. A blast fence for use transversely of an airport runway in deflecting and dissipating the blast of a jet engine, a supporting structure for said fence to maintain said

fence in an upright position at an angle to the horizontal or retracted to a substantially horizontal position, counterweight means biasing said fence toward its upright position, means pivotally supporting said fence in either of said positions on an axis adjacent to and parallel with the ground-engaging edge of said fence, bracing arms attached at one end to the upper margin of said fence and at the other end to said supporting structure and foldable intermediate their ends for lowering said fence to a substantially horizontal position, and power means for folding said arms to retract the fence on its pivotal support to a substantially horizontal position, or extending said arms to support the fence in its upright position.

3. A blast fence for use transversely of the blast from a jet engine comprising a supporting framework to pivotally support said fence in an upright position at an angle to the horizontal or retracted to a substantially horizontal position, said pivotal support being on an axis parallel to and spaced from the ground-engaging edge of said fence, counterweight means biasing said fence toward its upright position, said framework comprising foldable bracing arms to hold said fence in a selected position, means to fold said arms for lowering said fence to a substantially horizontal position, said latter means comprising rods to push said arms to folded position, or pull said arms to supporting position, and power means to operate said rods.

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