# CLAIMS

**[Claim 1]** An air flow regulator provided at a ventilation opening for at least either blowing air to an interior of a railway vehicle or sucking air from the interior of the railway vehicle, the air flow regulator comprising:

a frame defining an outer edge of the ventilation opening;

a bar which is a plate-shaped member spanned between portions of the frame so as to connect the portions to each other; and

a deformation means which elastically deforms the bar by a structure directly applying an external force to the bar attached to the frame so as to generate a reaction force in the bar.

**[Claim 2]** The air flow regulator according to claim 1, further comprising:

a reinforcement disposed to intersect the bar,

wherein the bar is elastically deformed by being applied the external force from the reinforcement by the deformation means.

**[Claim 3]** The air flow regulator according to claim 2,

wherein the deformation means elastically deforms the bar by bringing the reinforcement into contact with only one side surface of the bar.

**[Claim 4]** The air flow regulator according to claim 3,

wherein when the bar deformed by the deformation means is viewed in an axial direction of the ventilation opening, the bar is formed with a curve expanding in one direction so that the curve of the bar contacts the reinforcement at a maximum expanding portion thereof.

**[Claim 5]** The air flow regulator according to claim 4,

wherein the reinforcement is multiplied so that the air flow regulator comprises at least three reinforcements contacting the bar, and

wherein when the bar deformed by the deformation means is viewed in an axial direction of the ventilation opening, the bar is formed with at least three curves at portions thereof contacting the respective reinforcements so that at least one of the curves expands in a direction different from the other curves.

**[Claim 6]** The air flow regulator according to any one of claims 2 to 5,

wherein at least either the reinforcement or the bar is formed with a notch so that

the remaining reinforcement or the remaining bar is inserted into the notch.

**[Claim 7]** The air flow regulator according to claim 2,

wherein the reinforcement is formed with a plurality of protrusions protruding in an axial direction of the ventilation opening and contacting the bar, and

wherein the deformation means elastically deforms the bar by bringing the protrusions into contact with the bar.

**[Claim 8]** An air flow regulator provided at a ventilation opening for at least either blowing air to an interior of a railway vehicle or sucking air from the interior of the railway vehicle, the air flow regulator comprising:

a frame defining an outer edge of the ventilation opening;

a bar which is a plate-shaped member spanned between portions of the frame so as to connect the portions to each other; and

a deformation means which elastically deforms the bar so as to generate a reaction force in the bar,

wherein the deformation means elastically deforms the bar by transmitting a force from the frame to the bar via portions of the bar and the frame contacting each other,

wherein the deformation means applies a torsional force having a rotational axis in a longitudinal direction of the bar by a difference of attaching the bar to the frame in rotational direction having the rotational axis in the longitudinal direction between one longitudinal end of the bar and the other longitudinal end of the bar.

**[Claim 9]** An air flow regulator provided at a ventilation opening for at least either blowing air to an interior of a railway vehicle or sucking air from the interior of the railway vehicle, the air flow regulator comprising:

a frame defining an outer edge of the ventilation opening; and

a bar which is a plate-shaped member spanned between portions of the frame so as to connect the portions to each other;

wherein a reaction force is generated in the bar due to elastic deformation of the bar by a structure directly applying an external force to the bar attached to the frame so as to generate a reaction force in the bar.

**[Claim 10]** A method for manufacturing an air flow regulator provided at a ventilation opening for at least either blowing air to an interior of a railway vehicle or sucking air from the interior of the railway vehicle, the method comprising:

a deformation step of elastically deforming a bar which is a plate-shaped member spanned between portions of a frame defining an outer edge of the ventilation opening so as to connect the portions to each other by applying an external force; and

a fixation step of fixing the bar to the frame while maintaining a state of the bar elastically deformed by performing the deformation step.

**[Claim 11]** The method for manufacturing the air flow regulator according to claim 10,

wherein in the deformation step, by moving a reinforcement disposed to intersect the bar, the reinforcement presses the bar so that the bar is elastically deformed.