[0037] In an exemplary embodiment, the stator is comprised of a magnetically inert material, such as PVC piping, of suitable strength to support grain oriented steel lamination sheets.

[0038] In an exemplary embodiment, the magnetic flux emanating from the first and second magnets is approximately 10,000 Gauss.

[0039] FIG. **2** depicts an end cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention. As shown by FIG. **2**, the first set of magnets **104** with their north poles facing the stator **103** and their south poles coupled to the rotor **102** are positioned at opposing in-line positions on one end of the rotor **102**.

[0040] Similarly, the second set of magnets **105** with their south poles facing the stator **103** and their north poles coupled to the rotor **102** are positioned at opposing in-line positions on the same end of the rotor **102** at a ninety degree offset from the first set of magnets **104**. An identical first set of magnets **104** and second set of magnets **105** are coupled to the other end of the rotor **102** at similar positions.

[0041] FIG. **3** depicts a center cross sectional view of a reduced reaction alternating current generator according to an exemplary embodiment of the present invention. As shown by FIG. **3**, a single silicon steel piece **107** is positioned longitudinally in line with each magnet of the first and second sets of magnets **104**, **105** (not shown). The position of each silicon steel piece **107** provides for a predefined distance **108** between a silicon steel piece **107** and its corresponding magnet.

[0042] In an exemplary embodiment, the distance between a silicon steel piece **107** and its corresponding magnet is equal to the longitudinal length of the magnet.

[0043] Referring again to FIG. **1**, an electromagnetic force (EMF) is created across the conductor winding **106** embedded within the stator **103** when the magnetic flux emanating from the first set of magnets **104** and from the second set of magnets **105** cut through the conductor winding **106** as the rotor **102** rotates. Looking in the direction of arrow C in FIG. **1**, with the rotor **102** turning in a clockwise direction and the magnetic flux emanating in a vertically upward direction from the north poles of the first set of magnets **104**, the current generated as a result of the induced electromagnetic force will travel from left to right **110** within the conductor winding **106**.

[0044] The current direction is as per Lenz's Law which states when an electric current is induced in a conductor, the direction of the induced current is such that its magnetic effect will oppose the action that gives rise to the induced current. As such, the direction of the induced current **110** results in a torque such as to oppose the clockwise rotation of the rotor **102**. Specifically, looking in the direction of the arrow C in FIG. **1**, the interaction between the counter-clockwise magnetic field surrounding the conductor as a result of the induced electromagnetic force and the upward magnetic flux emanating from the north poles first pair of magnets **104** will create a counter-clockwise torque opposing the clockwise rotation of the rotor **102**.

[0045] FIG. **4** depicts a longitudinal cross sectional view of the flow of magnetic fields emanating from the first set of magnets within a reduced reaction generator according to an exemplary embodiment of the present invention. As shown by FIG. **4**, the magnetic flux **401** emanating from the north poles of the first set of magnets **104** travels vertically upward, across the air gap **108** and into the stator **103** as the magnetic flux **401** rotates with the rotor **102** relative to the stator **103**. As this rotating magnetic flux **401** enters the static stator **103**, it cuts sideways across the conductor winding **106** embedded within the stator **103** and induces a current within the conductor winding **106**.

[0046] Within the stator **103**, a portion of magnetic flux **402** is now trapped within the grain stampings within the stator **103** and flows longitudinally in an effort to return to a corresponding south pole of the first set of magnets **104**. This portion of the magnetic flux **402** is now static relative to the stator **103** and the embedded conductor winding **106**. As such, this portion of the magnetic flux **402** flows through and exits the stator **103** without any sideways movement relative to the embedded conductor winding **106** and therefore without inducing a current within the conductor winding **106**.

[0047] Outside of the stator **103**, a portion of the magnetic flux **403** crosses the air gap **108** and reaches the surface of a corresponding steel piece **107**. The steel piece **107** focuses the magnetic flux **403** within the air gap **108** providing a more efficient and specifically designed path for the magnetic flux **403** to return to a corresponding first set of magnets **104**. The magnetic flux **403** passes through the steel piece **107** and returns to a corresponding south pole of the first set of magnets **104** thereby closing the magnetic flux loop between north and south poles of each magnet of the first set of magnets **104**.

[0048] FIGS. **5** and **6** depict the interaction between the magnetic flux originating from the north poles of the first set of magnets and the magnetic flux resulting from an induced current in the conductor winding according to an exemplary embodiment of the present invention. In both FIGS. **5** and **6**, the current **110** induced in the conductor winding **106** by the clockwise rotation of the rotor **102** is shown coming out of the page. Moreover, in accordance with the application of the right hand rule, the magnetic flux **501** surrounding the conductor winding **106** as a result of the induced current **110** is shown as having a counter-clockwise rotation.

[0049] In FIG. **5**, the magnetic flux originating from the first set of magnets is shown traversing the air gap in an upward direction and interacting with the magnetic flux surrounding the conductor winding. As shown by FIG. **5**, the magnetic field **401** originating from the first set of magnets **104** is strengthened on the right side of the conductor winding **106** due to the superimposition of the magnetic field **501** induced in the conductor winding **106** in the same direction. However, the magnetic field **401** origination from the first set of magnets **104** is weakened on the left side of the conductor winding **106** due to the superimposition of the magnetic field **501** induced in the conductor winding **106** in the opposite direction. As a result of this interaction, the net magnetic field in the air-gap **108** over the surfaces of the first set of magnets **104** results in the application of a counter-clockwise torque **502** to the rotor **102** which opposes the clockwise rotation of the rotor **102**. This is in accordance with Lenz's Law and is confirmed by the right hand rule which shows that a conductor within an upward directed magnetic field and carrying a current in the induced direction (coming out of the page) will experience a counter-clockwise force.

[0050] In FIG. **6**, the portion of the magnetic flux that is routed back from the stator, downward across the air gap and through a silicon steel piece is shown interacting with the induced magnetic flux surrounding the conductor winding. As shown by FIG. **6**, the magnetic field **403** routed down through the silicon steel piece **107** is strengthened on the left