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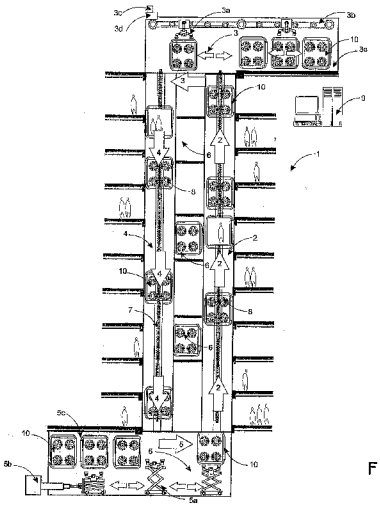

FIG. 1

(57) **Abstract:** A scalable multi-car cyclic magnetic elevator system with linear gravity electric generator traversing an mono-directional cyclic elevator shaft of a building comprising a magnetic elevator car, a magnetic levitation guideway provided along the height of each corner of said elevator shaft, a passive magnetic array rotary propulsion wheel assembly provided on at least on the three sides of said elevator shaft, said magnetic propulsion assembly being defined by a plurality of magnetic array rotary propulsion wheels provided with meshed gear teeth at the periphery thereof, a magnetic array propulsion track secured along the entire height of said elevator shaft and in attractive North-South-North-South communication with respective magnetic array propulsion wheel assembly, a motor rotatably driving said meshed magnetic array propulsion wheels, and a linear gravity electric motor/generator disposed adjacent said magnetic levitation guideway and communicating with said magnetic suspension stabilizer and an elevator cab service bay intermittently provided along the length of the mono-directional cyclic elevator shaft for service or repair purposes and at the extreme opposite ends of the magnetic elevator shaft is a cyclic transition bay where the multi-car magnetic elevator module will change shaft from one mono-directional shaft to another in a cyclic pattern.

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MULTI-CAR CYCLIC MAGNETIC ELEVATOR WITH GRAVITY LINEAR ELECTRIC GENERATOR/MOTOR

The present invention relates generally to elevators but more particularly to a scalable multi-car cyclic magnetic elevator cars with gravity linear electric generator including a repulsive magnetic guide assembly to minimizing undesirable movements of the elevator via non-contact magnetic repulsive system. It also uses rotary permanent magnet array magnetic wheel with reinforced gear wheels for attractive magnetic propulsion rather than using an electromagnetic wheel or linear motor propulsion system that is dangerous if used on vertical propulsion because electromagnets are dependent on electricity to attain attractive propulsion, and due to gravity the elevator cars needs to be vertically secured which is what is offered by this present designed magnetic elevator propulsion system with rotary passive magnetic array propulsion wheel. This elevator system is scalable because of the nature this elevator system has to offer, meaning it can accommodate a multiple car system on mono-directional shafts and will deploy or add elevators cars on a need to use basis making this economical elevator system compared to conventional elevator systems.

A conventional traction type elevator includes a cab mounted in a car frame, a counterweight attached to the car frame by a rope or cable, and a drive assembly including a machine driving a traction sheave that engages the rope. As the machine turns the sheave, friction forces between the sheave and the rope move the rope and thereby cause the car frame and counterweight to raise and lower.

A limiting factor in the use of ropes or cable, however, is their durability. As the ropes pass through the sheave they have the tendency to migrate from side to side and contact the sheave rope separators. Contact with the separators increases frictional forces that cause significant abrasion and can degrade the rope materials. Such undesirable migration and resulting friction may also be problematic for flat ropes

such as coated steel belts (CSB) that are guided through additional elevator drive components such as rope support roller assemblies attached to the car frame and counterweight.

In some instances, many have thought of guiding the rope at particular locations throughout the elevator drive system to restrain undesirable movement and vibration of the rope. Others have tried to minimize contact between the guide system and rope to further reduce undesirable frictional forces. These, however, have not solved the problem in the use of ropes as above-mentioned.

After a careful study about the existence of these mechanical cable electric elevators, a breakthrough technology was invented where future elevators will no longer need cables or ropes or weight to pull up and down the elevator. Using magnetic levitation and attractive magnetic array propulsion principles, the magnetic elevator was enclosed in a passive magnetic frictionless shaft or guide way and the means of propulsion was using a combination of magnetic array rotary propulsion wheel with gear tooth safety system where the plurality of propulsion motor were attached to the said magnetic array rotary propulsion wheel. The magnetic array rotary propulsion wheel uses a special magnetic array where the North-South-North-South Magnetic field will attract along the length of the magnetic propulsion guide-way using either a Halbach Array, Stetler Array, Alternating Recessed Curve (A.R.C.) or Alternating Recessed Magnetic (A.R.M.) Array where the magnetic field will sum up algebraically following the U shape or Halbach Array vector rotation theorem on both the rotating magnetic wheel attach to the Elevator Car compartment and on the magnetic propulsion guide-way mounted along the length of the elevator shaft.

A physically contacting secondary gear wheel system mounted on the magnetic array rotary propulsion wheel and along the length of the guide-way will

give extra safety feature. The air gap is maintained by a roller to maintain a non-contact system between the rotating magnetic field of the magnetic array rotary propulsion wheel and the stationary magnetic array propulsion guide way. This non-contact propulsion system means less maintenance is necessary and wear and tear of the gear tooth wheel is remote. And this time it uses a servo-motor or any types of motors and an attractive magnetic electromagnetic wheel or propulsion system to attain magnetic propulsion that will bring the elevator up and down faster, safer and intelligently using servo motors to control motion. Because the propulsion mechanism is now mounted on the moving elevator compartment, thus eliminate the need for cables or ropes and therefore with this important breakthrough, it is likely that this new magnetic elevator system can adopt a multi-car elevator system.

The advantage of having a multi-car elevator system is that it allows more than one elevator car or cab that can travel along the length of the cyclic elevator mono-directional shaft. That means that in the future, fewer shafts will be needed to cater multiple cars thus decongesting the traffic flow of the passengers that moves to and pro in the building using at least only two shafts rather than using multiple shaft system. Considering the cost and revenue generating spaces of the elevator shaft which is a possible rentable space real estate wise, the space saving shaft provided by a cyclic multi-car elevator system is a plus factor for the landlords and real estate developers.

Therefore the mono-directional shafts will strictly be used for either upward or downward movement of the traffic in a continuous rotating or cyclic manner. Unlike older multi car system they use cables to move the elevator car, here, with this new invention, having a cable-less system non-contacting magnetic array elevator system means less complicated and more dynamic in terms of changing lanes or shaft

direction, etc. A special service bays will be provided along the length of the shaft for troubleshooting of the elevators cars and towards the ends of each loop, a special transition point or terminal or service bay will be provided to change the elevator cars using a mechanical systems either using a robotic arm hydraulic system or electromagnetic lifting system.

What's more, with a magnetic elevator, it is now possible to cater ultra high elevators on a single shaft and the elevators can move extremely fast serving to a pro more traffic in a given time than using a regular cable based elevator system. Especially now a days that the buildings are soaring high at least at more than 110 stories means faster multi-car elevator system is needed to move the people inside the building. A special linear synchronous segmented electromagnetic array or induction motor/generator will be employed for hi-speed magnetic elevator system.

What's more this elevator is equipped with an onboard linear motor/alternator/generator system that can charge the rechargeable battery on board the elevator and the guide way shaft has copper or conductor coils arranged to maximize the axial flux cutting of the field that is directly engaged with a permanent magnetic array on board the elevator such that as soon as the magnetic field is cut through by the copper or conductor coil along the shaft caused by the motion of the elevator either upward or downward by virtue of Faraday's Law of Induction, the copper coil located along the shaft can produce alternating current or direct current that can act as an electric generator to power the whole building or infrastructure converting Kinetic Energy to Electrical Energy. The Mass of the free falling elevator by virtue of gravitational fall will be converted to a valuable and storable energy—ELECTRICITY.

Another advantage with this elevator is that since it can produce electricity, the passenger will no longer worry about brownouts and at the same time this elevator is worry free because there is no longer cables that is needed in the whole operation that could easily corrode, wear and tear in time especially in prolonged daily operation.

The primary object of the present invention therefore is to provide a magnetic elevator that uses a combination of passive magnetic array rotary propulsion wheel and gear tooth wheel system to drive elevator cars up and down of a building in a continuous cyclic manner through a mono-directional shaft system having a transition bay in both ends of the elevator shaft.

Further object of this invention is the use of multi-car or multi-cab elevator system thus allowing more traffic flow on a mono-directional shaft with at least one shaft catering the passengers that want to go up, and another shaft that caters passengers that will want to go down, the said elevator shaft is connected by a transition service bay where the elevator cars will change lane or change shaft by means of a special shifting mechanism or lifting mechanism, i.e., hydraulics or electromagnetic robotic arm.

Another object of this invention is the scalable nature this multi car elevator system is. All the building developer or Architects needs to do is to develop only at least two elevator shafts and there is no need to develop more shafts because of the scalable nature this multi-car cyclic magnetic elevator system is. All they need to do is to add additional elevator cars on a need to have or add basis, say assuming the number of traffic has increased, and thus require additional cars. This is beneficial to the real estate developer because they not only save the rentable space of the elevator

shaft, but they can add additional elevators cars as traffic increase. This system can be adopted to existing conventional elevator system.

Also another object of this invention is the invention of service bays intermittently located along the length of the elevator shaft. These service bays will cater defective elevator car thus allowing the continuous flow of traffic of other elevators. A special gear system is mounted on the gearbox assembly of the magnetic array rotary wheel so that the elevator cars will only move strictly on one direction for safety considerations.

Another object of this invention is a magnetic elevator having a gravity linear electric generator having a plurality of magnetic array propelling system that suspends the elevator car in midair and driving said elevator car up and down the elevator shaft.

Still an object of this invention for a magnetic elevator having a gravity linear electric generator that generates electricity to supply electric requirement of the propulsion motor thereof to run the magnetic array propelling system.

Another object of this invention is the life-saving feature this elevator will offer in cases of emergency. When engaged to emergency mode, the elevator will shut down areas affected by natural and man made catastrophe such as fire or earthquake. Thus when the elevator is on an emergency mode, it will deploy the passenger from the unaffected floors to come down as fast as possible to bring people down on a much faster mode. Since there is no more cable to cut along the entire length of the elevator shaft thus safeguarding the people from man made or natural catastrophe. On the event that a fire or an airplane will struck at a certain floor of the building, event on this uneventful catastrophe, the magnetic elevator will continue to bring to a pro of people or goods to safety. A special locking mechanism will be provided on every floor to protect the magnetic elevator guide way from debris.

These and other objects and advantages will come to view and be understood upon a reading of the detailed description when taken in conjunction with the appended drawings:

Figure 1 is the elevation view of the multi-car cyclic elevator system;

Figure 2 is a perspective view of the preferred embodiment for a magnetic elevator with gravity linear electric generator according to the present invention;

Figure 3 is a side view;

Figure 3A is a fragmentary perspective view of the magnetic levitation guideway of the magnetic elevator;

Figure 3B is a fragmentary perspective view of the conventional roller guide with rail guide way;

Figure 3C is a sectional view of the rotary magnetic array propulsion system taken along line 2-2' of Figure 3;

Figure 4 is a perspective view of one of the presentation of the magnetic array propulsion wheel with respect to the linear magnetic guide way;

Figure 5 is a top view of the magnetic elevator showing the magnetic levitation propulsion assemblies thereof;

Figure 6 is a fragmentary top view of the linear segmented electromagnetic array linear gravity generator/motor/levitator/brake;

Figure 6A is a perspective view of the linear segmented electromagnetic array gravity generator/motor/levitator/brake;

Figure 7 is a perspective view of another type of magnetic propulsion assembly for the subject elevator;

Figure 8 is a elevation view of the passive Halbach Array showing the attractive engagement of two attracting magnetic array;

Figure 8A is a elevation view of the passive mono-polar Halbach Array showing the repulsive engagement of two opposing magnetic array;

Figure 8B is the elevation view of the passive Alternating Recessed Magnetic (A.R.M.) Array showing the recessed arrangement of linear magnetic array;

Figure 8C is the elevation view of the passive Alternating Recessed Curve (A.R.C.) Array showing the recessed arrangement of circular magnetic array;

Figure 8D is the isometric view of the passive Stetler Magnetic Array;

Referring now to the several views of the drawing in detail, there is shown a magnetic elevator herewith can also be referred as a multi-car cyclic magnetic elevator system with gravity linear electric generator generally designated as reference numeral 1. Figure 1 shows the elevation view of the cyclic multi-car magnetic elevator system 1 disposed along the length of a building with a plurality of cyclic multi-car magnetic elevator car 10 which is disposed in every location shown along the entire length of the parallel upward mono-directional shaft 2 that goes strictly upwards and an another downward mono-directional shaft 4 that strictly goes downwards. The cyclic multi-car magnetic elevator car 10 will run along the length of both mono-directional shafts 2 and 4 via a linear magnetic array guide way 7 by virtue of the rotating magnetic array rotary wheel 8. To complete the cyclic pattern of this cyclic multi-car magnetic elevator system 1, an upper end transition bay 3 and lower end transition bay 5 is provided both to function as a transition area or service area or terminal to store as many multi-car elevator cars 10 as possible. On the upper end transition bay 3 has a upper bay mechanical electromagnetic arm 3a will attract the cyclic multi-car magnetic elevator car 10 and move it anywhere in the upper end transition bay 3 or to the upper end terminal bay 3e or to the downward mono-directional shaft 4 to continue the rotation of elevator service. The upper bay mechanical electromagnetic arm 3a is attached to a mechanical or hydraulic conveyor

system 3b driven by a motor 3c and a gear box 3d. Once the upper bay mechanical electromagnetic arm 3a will lock and secure the cyclic multi-car magnetic elevator car 10 to the downward mono-directional shaft 4, it will continue its elevator service down to the lower end transition bay 5 where the lower bay mechanical electromagnetic arm 5a will attract the cyclic multi-car magnetic elevator car 10 and move it anywhere in the lower end transition bay 5 or at the lower end terminal bay 5c for service, repair, storage or move it back to the upward mono-directional shaft 2 to complete the magnetic elevator cyclic pattern. This is attained using a hydraulic or mechanical arm system 5b that pulls the lower bay mechanical electromagnetic arm 5a forward or backward.

The advantage with this cyclic multi-car elevator system is the scalable nature this multi car elevator system is. All the building developer or Architects needs to do is to develop only at least two elevator shafts (upward or downward shaft) and there is no need to develop more shafts because of the scalable nature this multi-car cyclic magnetic elevator system is. All they need to do is to add additional elevator cars on a need to have or add basis, say assuming the number of traffic has increased, and thus require additional cars.

A computer control navigation system 9 that controls the orderly flow of the cyclic multi-car magnetic elevator system 1, if it detects some defects or warning signal triggered by some sensors (not shown) located on the cyclic multi-car magnetic elevator car 10, one of the middle service bay 6 will be opened to facilitate the defective cyclic multi-car magnetic elevator car 10 for immediate repair. This middle service bay 6 will help facilitate the continuous non stop flow of traffic of elevators within the building especially if one of the cyclic multi-car magnetic elevator car 10 is experiencing technical problems in the middle of the building. An elevator door 17 is mounted on every cyclic multi-car magnetic elevator car 10.

Figure 2, 3, 3A, 3C, 4 and 5 are the perspective view, side view, sectional, isometric and top view respectively of the preferred embodiment for a magnetic elevator with gravity linear electric generator according to the present invention having a plurality of rotary magnetic array propulsion wheel 8 where the said propulsion wheels are attached with a magnetic array propulsion rotor 8b arranged in a North-South-North-South Alternating Recessed Curve (A.R.C.) Array or Halbach Array, Stelter Array using permanent magnets such as Neodymium Iron Boron or other Rare Earth Magnets or magnets having stronger attractive force. The said magnetic array propulsion rotor 8b is enclosed by a plurality of propulsion gear wheels 8a that is connected to an axle 13a that is driven by a motor 12 attached to a gear box 13.

The propulsion gear wheels 8a will act as a back up in case the magnetic array propulsion rotor 8b is not sufficient enough to carry the load or will act as a secondary physically contacting gear propulsion system. The said magnetic array propulsion wheel 8 will be in non contact engagement with linear magnetic array guide way 7 that will act as a stator. The said linear magnetic array guide way 7 is composed with a linear magnetic array stator 7a which is made of permanent magnets ideally Neodymium Iron Boron or other Rare Earth Magnets or having stronger attractive force arranged in an North-South-North-South Alternating Recessed Magnetic (A.R.M.) Array or Halbach Array, Stelter Array. A linear gear guide way 7b will sandwich the linear magnetic array stator 7a that is mounted on a linear guide way holder 7c. A roller 8c will maintain the necessary air gap so that the rotary magnetic array propulsion wheel 8 will attain the non-contact attractive magnetic propulsion with respect to the linear magnetic array guide way 7.

A non contact magnetic levitation is attained when the cyclic multi-car magnetic elevator car 10 is mounted with the plurality of magnetic array levitator 11a

arranged in a mono-polar Alternating Recessed Magnetic (A.R.M.) Array, mono-polar Halbach Array, U-shaped Array, mono-polar Stetler array that is in repulsive non contact engagement with the intermittently spaced apart magnetic array levitation guide way 11b arranged in a mono-polar Alternating Recessed Magnetic (A.R.M.) Array, mono-polar Halbach Array, U-shaped Array, mono-polar Stetler array that is mounted along the entire length of the mono-directional shaft 2 and 4. A roller stabilizer 11c will help the non-contact magnetic levitation.

However if cost is prohibitive for the magnetic levitation guide way configuration, a simple traditional roller guide will be used instead of the magnetic levitation guide way system. In Figure 3B shows the conventional roller guide system where the plurality of conventional roller stabilizer 11c connected to a roller holder 11e will be securely engaged in a physically contacting conventional guide that will follow the length of the conventional rail guide way 11f located at least in two sides of the mono-directional elevator shaft (not shown).

The said multi-car cyclic elevator system with gravity linear electric generator 1 is designed to generate electricity my converting kinetic energy to electricity by virtue of the falling mass which is the elevator and its load. This will help recover the energy by using gravity to produce electricity using the Faraday Law of Induction. An axial flux cutting using linear segmented electromagnetic array will be used to produce maximum electricity through LORENZ FORCE LAW. A reverse can be attained if the stator, instead of producing electricity can be converted to a high torque motor by supplying electricity to the linear segmented electromagnetic array stator coils. It can be said that a motor can be a generator or a linear motor can be a linear generator and vice versa. And if we apply the principle of LENZ LAW the same mechanism and design can be used to attain non contact levitation or attain magnetic braking that will be activated in cases of emergency or emergency braking system.

In Figure 6, 6A shows the segmented electromagnetic array linear gravity generator/motor/levitator/brake having copper conductor stator 15 wounded in a plastic bobbins iron-less core 15a arranged in an axial flux cutting to maximize the electric generation and or high torque motor. A magnetic array linear rotor 14 is arranged in a Halbach Array, Stetler Array or Alternating Recessed Magnetic (A.R.M.) Array using strong permanent magnets such as Neodymium Iron Boron or other Rare Earth Magnets such as Samarium Cobalt Nickel or Aluminum Nickel Cobalt. Electricity can be stored on board the elevator battery pack 16 or in a central power storage UPS system located within the building (not shown). However this linear generator system can also be used as a linear motor, where instead of generating electricity, the segmented electromagnetic array linear gravity generator having copper conductor stator 15 will be supplied with electricity controlled by an electronic system (not shown) that will drive the alternating North-South-North-South magnetic array linear rotor 14 is arranged in a Halbach Array to move upward or downward depending on the polarity of the electricity supplies to the copper conductor stator 15.

Figure 7 is another embodiment of the magnetic propulsion system, ideal for industrial or heavy loads. A magnetic propulsion track 18 having a magnetic array traction foot 18a mounted to steel belts 18b that is rotated by the sprocket 18c to attain attractive magnetic propulsion. A motor 12 is connected by an axle 19 that will drive one of the sprockets located at the magnetic propulsion track 18. A symmetrical magnetic propulsion track 20 can be mounted on any side of the elevator body to increase performance and carrying capacity.

Figure 8 is a Halbach Array configuration showing the true south magnetic pole 21a and true north magnetic pole 21b where a lateral magnet 21c is arranged in such a way that flux lines will follow the vector rotation theorem of Halbach Array or

U-shape magnet represented by a dotted flux line 21d. This magnetic array is ideal for concentrated attractive magnetic purposes like magnetic propulsion or for electric generation where the flux density is concentrated on one side of the array, and cancels on the other side of the array according to Halbach Array vector rotation theorem.

Figure 8A is a mono-polar Halbach Array configuration showing the true south magnetic pole 21a and true north magnetic pole 21b where a lateral magnet 21c is arranged in such a way that flux lines will follow the vector rotation theorem of Halbach Array or U-shape magnet represented by a dotted flux line 21d. This magnetic array is ideal for concentrated repulsive purposes like magnetic levitation where the flux density is concentrated on one side of the array, and cancels on the other side of the array according to Halbach Array vector rotation theorem.

Figure 8B is an Alternating Recessed Magnetic (A.R.M.) Array configuration showing the true south magnetic pole 21a and true north magnetic pole 21b where a lateral magnet 21c is arranged in such a way that flux lines will follow the vector rotation theorem of Halbach Array or U-shape magnet represented by a dotted flux line 21d. A slightly recessed arrangement was attained where the (X) 21e is => 1-99% recessed away from the base to increase the magnetic flux density increasing the magnetic field strength of the array than the Halbach Array. This magnetic array is ideal for concentrated attractive magnetic purposes like linear magnetic guide way where the flux density is concentrated on one side of the array, and cancels on the other side of the array according to Halbach Array vector rotation theorem thus increase the attractive engagements of permanent magnets thus increase also it load carrying capacity.

Figure 8C is an Alternating Recessed Curve (A.R.C.) Array configuration showing the true south magnetic pole 21a and true north magnetic pole 21b where a lateral magnet 21c is arranged in such a way that flux lines will follow the vector

rotation theorem of Halbach Array or U-shape magnet represented by a dotted flux line 21d. A slightly recessed arrangement was attained where the (X) 21e is => 1-99% recessed away from the base to increase the magnetic flux density increasing the magnetic field strength of the array than the Halbach Array. This magnetic array is ideal for concentrated attractive magnetic purposes like rotary magnetic array wheel where the flux density is concentrated on one side of the array, and cancels on the other side of the array according to Halbach Array vector rotation theorem thus increase the attractive engagements of permanent magnets thus increase also it load carrying capacity and magnetic traction on the linear magnetic array guide way.

Figure 8D is a Stetler Array configuration of passive magnetic array where the strength of all magnetic fields will sum up algebraically thus increase the repulsive or attractive performance of a passive magnetic array. The true south magnetic pole 21a or the true north magnetic pole 21b is sandwiched from all its sides by lateral magnet 21c to increase the strength of either the true north magnetic pole 21b or true south magnetic pole 21a. The settler array can be configures to become mono-polar or bi-polar depending on the use or application of the said magnet either for propulsion or for levitation. It can be used on the linear propulsion guide way, rotary propulsion magnetic array wheel or mono-polar magnetic levitation purposes.

CLAIM:

1. A scalable multi-car cyclic magnetic elevator with linear gravity electric generator traversing a mono-directional cyclic magnetic elevator shaft of a building comprising a plurality of scalable magnetic elevator cars, a magnetic levitation guideway provided at least at each corner of said elevator shaft, a linear magnetic array suspension stabilizer disposed along the height of the corresponding corner of said magnetic elevator car and in repulsive communication with said magnetic levitation guideway, a passive magnetic array propulsion assembly provided at least on three sides of said elevator shaft, said magnetic propulsion assembly being defined by a plurality of magnetic array rotary propulsion wheels provided with meshed gear teeth at the periphery thereof, a plurality of permanent or electromagnets array secured on said magnetic wheels, said permanent or electromagnets being provided with copper or conductor windings thereof, a magnetic array propulsion track secured along the entire height of said mono-directional cyclic elevator shaft and in attractive communication with respective magnetic propulsion guide way, a motor rotatably driving said meshed magnetic array wheels and magnetic array rotary propulsion wheel via a high torque gearbox, and a linear segmented electromagnetic array gravity electric generator/motor disposed adjacent said magnetic levitation guideway.

2. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 1 wherein said magnetic levitation guideway and said magnetic suspension stabilizer consists respectively of a plurality of Alternating Recessed Magnetic (A.R.M.) Array, U or C-shaped or mono-polar Halbach or Stetler Array permanent or electromagnets array whereby

the U or C-shaped or mono-polar Halbach or Stetler Array permanent or electromagnets of said magnetic levitation guideway are in repulsive relation with the permanent or electromagnetic array of said magnetic suspension stabilizer.

3. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 1 wherein said permanent magnets or electromagnets of said magnetic wheel assemblies are arrange following the vector rotation of a U shaped magnet or a Halbach array.

4. A magnetic elevator with linear gravity electric generator according to claim 2 said linear gravity electric generator is defined by a stator having a non-iron core such as plastic bobbins being wound with copper or any conductor coil disposed along the entire length of said elevator shaft, and a series of linear U or C-shaped or Halbach Array rotor magnets disposed along the length of said elevator car spacedly communicating with said linear electromagnetic stator. The design of the conductor windings will maximize the axial flux cutting of the magnetic field via LORENZ LAW FORCE.

5. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 3 wherein each of magnetic array rotary propulsion wheel of said magnetic propulsion assembly being defined by a plurality of magnetic array Alternating Recessed Curve (A.R.C.) Array or Halbach Array angularly disposed thereof wherein at least a surface attractively communication with said magnetic array propulsion track where the rotating magnetic wheel is in an attractive alternating North-South-North-South attractive communication.

6. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 1 wherein said magnetic levitation guideway having a plurality of spaced apart passive magnetic disc assemblies, each including a magnetic disc rotatably secured thereat, said magnetic disc having a plurality of permanent magnets disposed in a circular mono-polar Halbach array or mono-polar Stetler Array arrangement thereof

7. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 6 wherein said linear gravity electric generator is disposed between passive linear magnetic array, Alternating Recessed Magnetic (A.R.M.) Array, Stetler Array or Halbach Array permanent magnet.

8. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 6 said a magnetic suspension stabilizer including a plurality of electromagnetic array spinning discs spacedly disposed in a linear pattern thereof and in levitating communication with said magnetic levitation guideway.

9. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 1 wherein said magnetic levitation guideway is integrated with the linear gravity electric generator and being defined by a copper coil or any conductors disposed at the entire length of the building using the Faraday's Law of Induction to produce electricity thereof.

10. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 9 wherein said magnetic suspension stabilizer being defined by U or C -shaped permanent magnets disposed along the entire height of said elevator car and enclosing said linear gravity electric generator.

11. A multi-car cyclic magnetic elevator traversing an elevator shaft of a building comprising an elevator car having a door thereof, a magnetic guideway provided along the entire length of said elevator shaft, said magnetic guideway having a plurality of similarly arranged permanent magnets, and magnetic array rotary propulsion wheel assembly provided at the sidewalls of said elevator car, said magnetic array rotary propulsion wheel assembly consist of a pair of opposed magnetic wheel tracks, each being defined by a chain-liked track having a plurality of interconnected permanent magnets arranged similarly thereof and are in attractive communication with the permanent magnets of said magnetic guideway, a chain supporting said interconnected permanent magnets, a plurality of sprockets rotatably supporting said chain, and a prime mover connected to one of said sprockets.

12. A mono-directional cyclic elevator shaft system having a transition bays provided on the extreme ends of the said elevator shafts that provided a transition point for the multi-car magnetic elevators system according to claim 1.

13. A mono-directional magnetic elevator shaft system according to claim 12 will have a transition bay where a plurality robotic arm or electromagnetic hydraulic system will be installed to move the multi-car magnetic elevator cars from one shaft to another either from going up shaft to the going down shaft.

14. A robotic arm according to claim 13 will have a special electromagnetic device that will grab electromagnetically the elevator car and a hydraulic system will move the elevator car to the other shaft to make the whole system function as a cyclic elevator system. The elevator car will have a

ferromagnetic material at the lower or upper the extreme corners the said elevator car where the electromagnetic arm will be electromagnetically secured.

15. A plurality of special transition service bay will be provided along the length of the elevator shaft according to claim 12 will provide a special repairing area in case of mechanical or electronic malfunction. These service bays will cater temporarily any elevator cars that need special service thus allowing the smooth flow of traffic for other elevator cars that still wants to move along the length of the shaft.

16. The transition service bays according to claim 15 will be provided at least one on every mono directional shaft.

17. A multi-car cyclic elevator car according to claim 1 where the gear wheel tooth system is provided on the magnetic array rotary propulsion wheel to give extra safety feature. This gear wheel system will provide extra safety net for this elevator system. A roller guide will maintain the necessary air-gap between the magnetic array rotary propulsion wheel and the linear magnetic array propulsion guide way.

18. A linear synchronous segmented electromagnetic array motor will be provided at least on two sides of the elevator assembly for faster deployment of passengers especially on ultra high buildings. The said linear segmented electromagnetic array motor can also be converted to a generator by converting the gravitational kinetic energy of the falling mass to electrical energy via Faradays Law of Induction. A passive linear magnetic array rotor such as Halbach Array, Stetler Array or Alternating Recessed Magnetic (A.R.M.) Array will be used to increase the torque or electric production of the linear motor and or generator.

19. An multi-car cyclic elevator system according to claim 1 will use gravitational forces by allowing the freely falling elevator car mass to convert Kinetic energy to electrical energy by virtue of Faraday's Law of Induction.

20. A special locking system on the rotary magnetic array wheel will be provided to attain a mono-directional flow of the said magnetic elevator so that the magnetic elevator will move on a forward motion only. A special locking system is provided in one of the sprocket of the said rotary magnetic array wheel.

21. A multi-car cyclic magnetic elevator with linear gravity electric generator according to claim 1 will use conventional roller guide rather than using passive magnetic levitation guide way or electromagnetic guide way system to maintain stable alignment of the elevator car within the elevator shaft.

22. A magnetic array using Alternating Recessed Curve (A.R.C.) Array or Alternating Recessed Magnetic (A.R.M.) Array will recess the true north or true south magnetic pole with respect to the lateral magnet by => 1-99% to increase the concentrated magnetic flux density, where the magnetic flux follows the vector rotation theorem of Halbach Array or U-shaped magnet.

23. A multi car cyclic magnetic elevator system according to claim 1 can be scalable with plurality of elevator cars. The building developer or Architects may develop only at least two elevator shafts and there is no need to develop more shafts because of the scalable nature this multi-car cyclic magnetic elevator system is. Additional elevator cars will be

provided on a need to have or add basis, say assuming the number of traffic has increased, and thus require additional cars.

24. A multi car cyclic magnetic elevator system according to claim 1 can be adopted to existing elevator shafts by replacing the conventional hoist ways with magnetic propulsion guide way and converting the conventional elevator cars with a multi-car magnetic elevator with rotary magnetic array propulsion wheel.

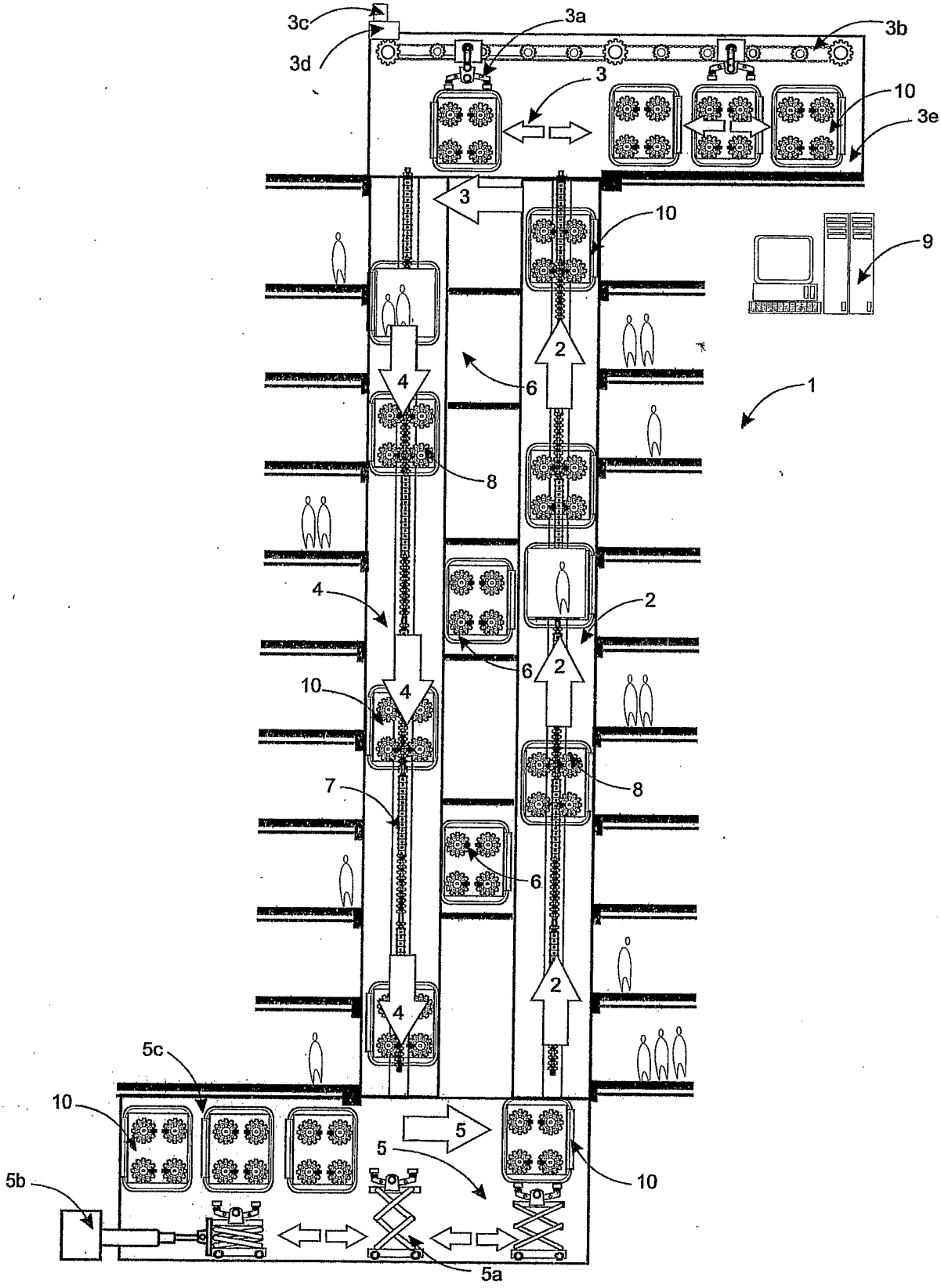

FIG. 1

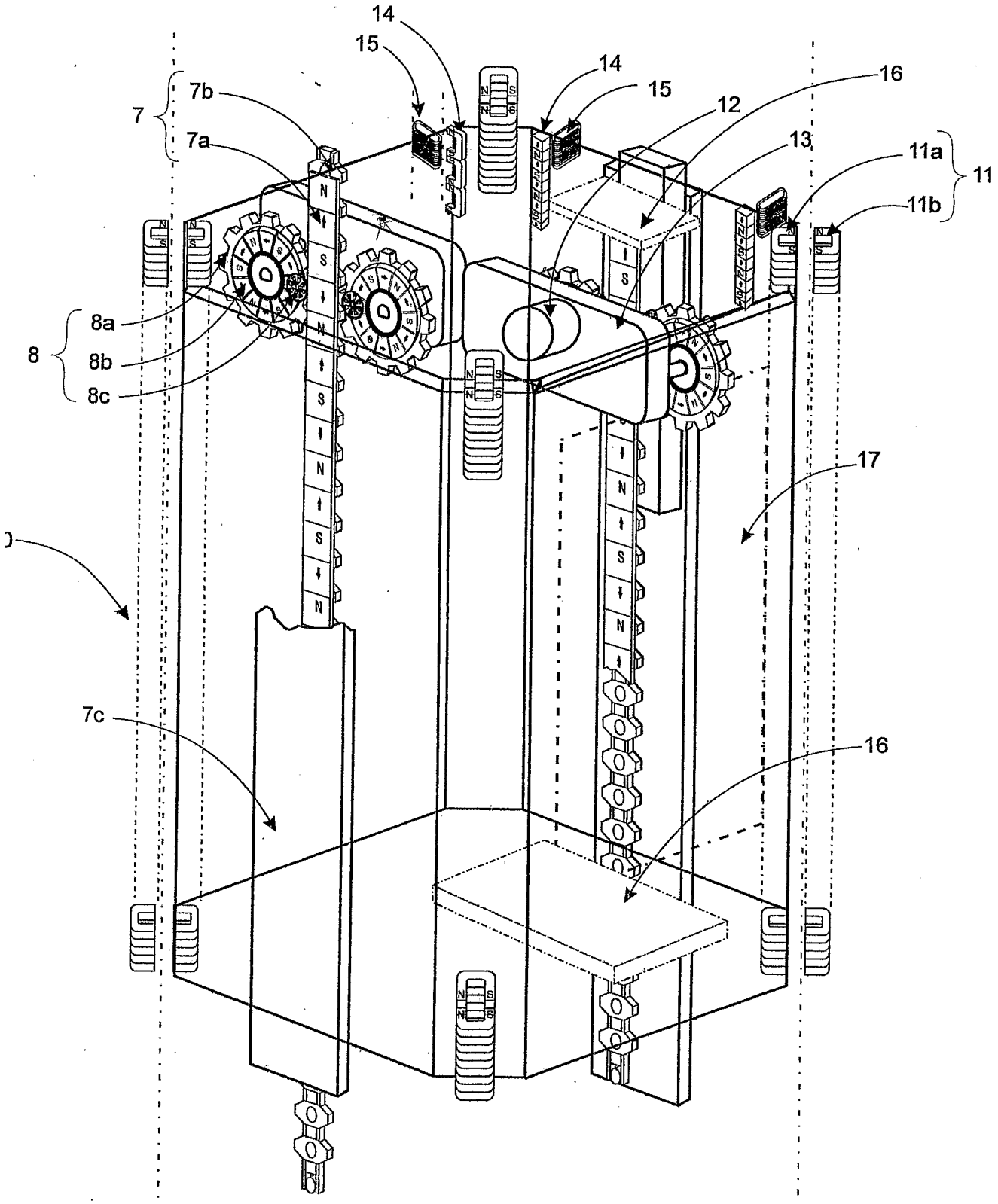

FIG. 2

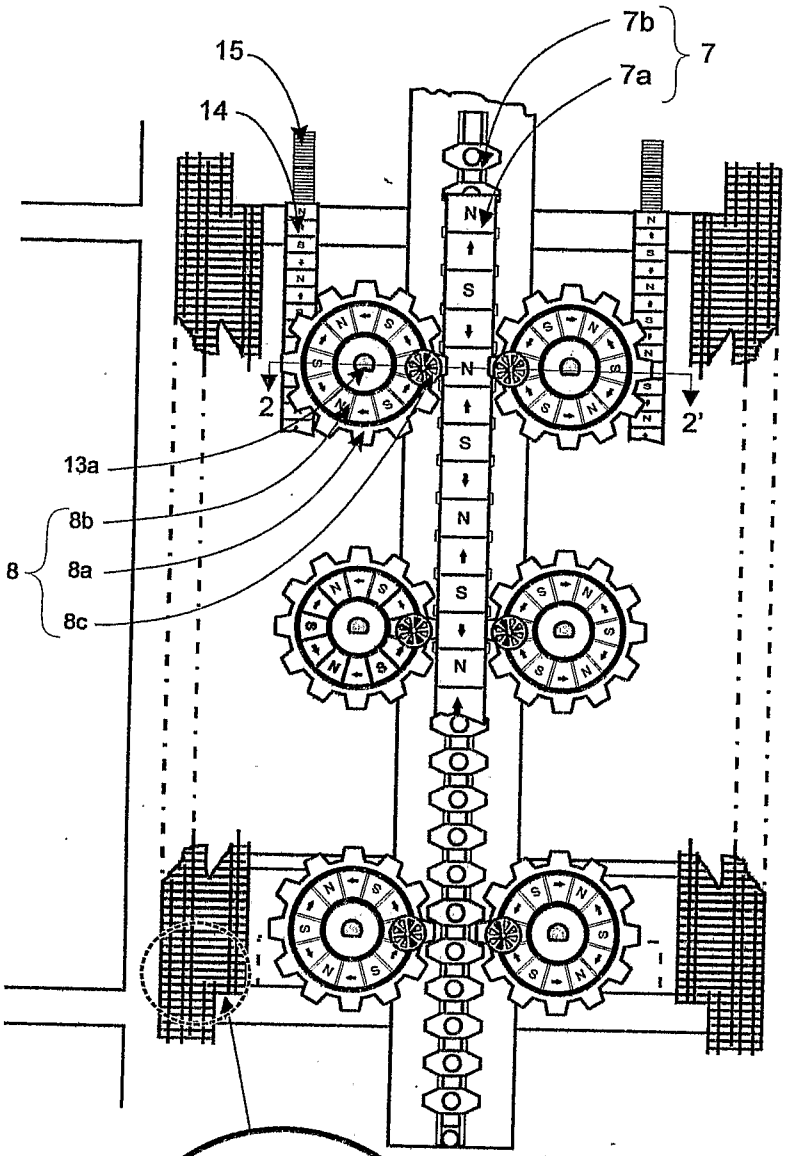

FIG. 3

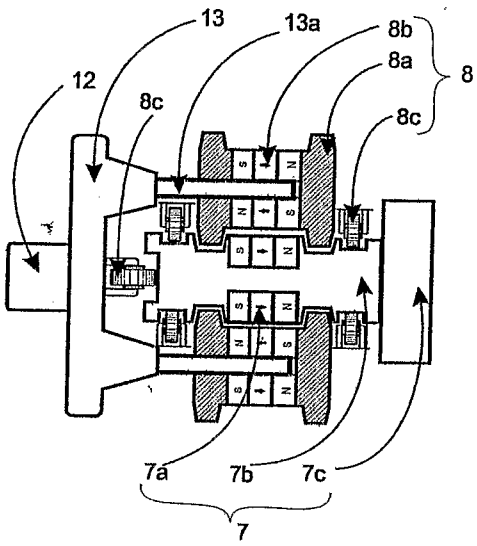

FIG. 3C

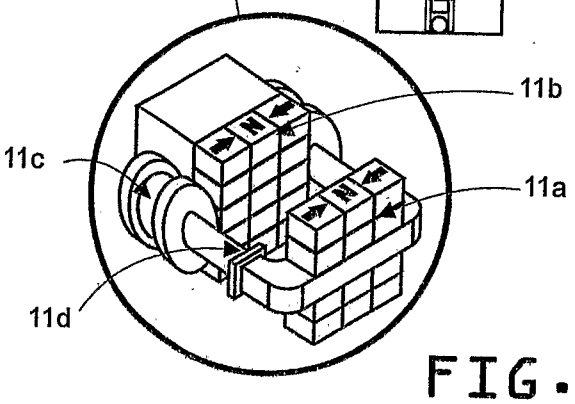

FIG. 3A

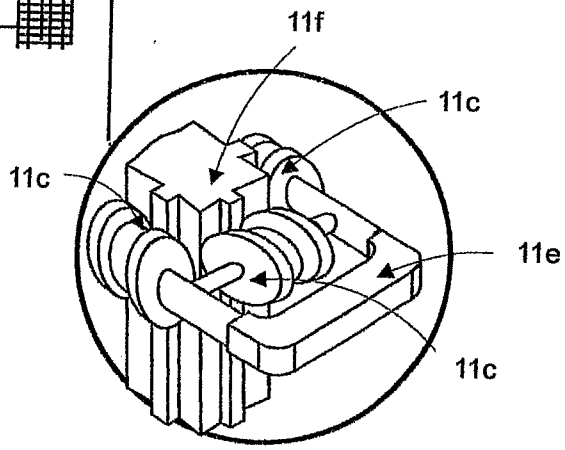

FIG. 3B

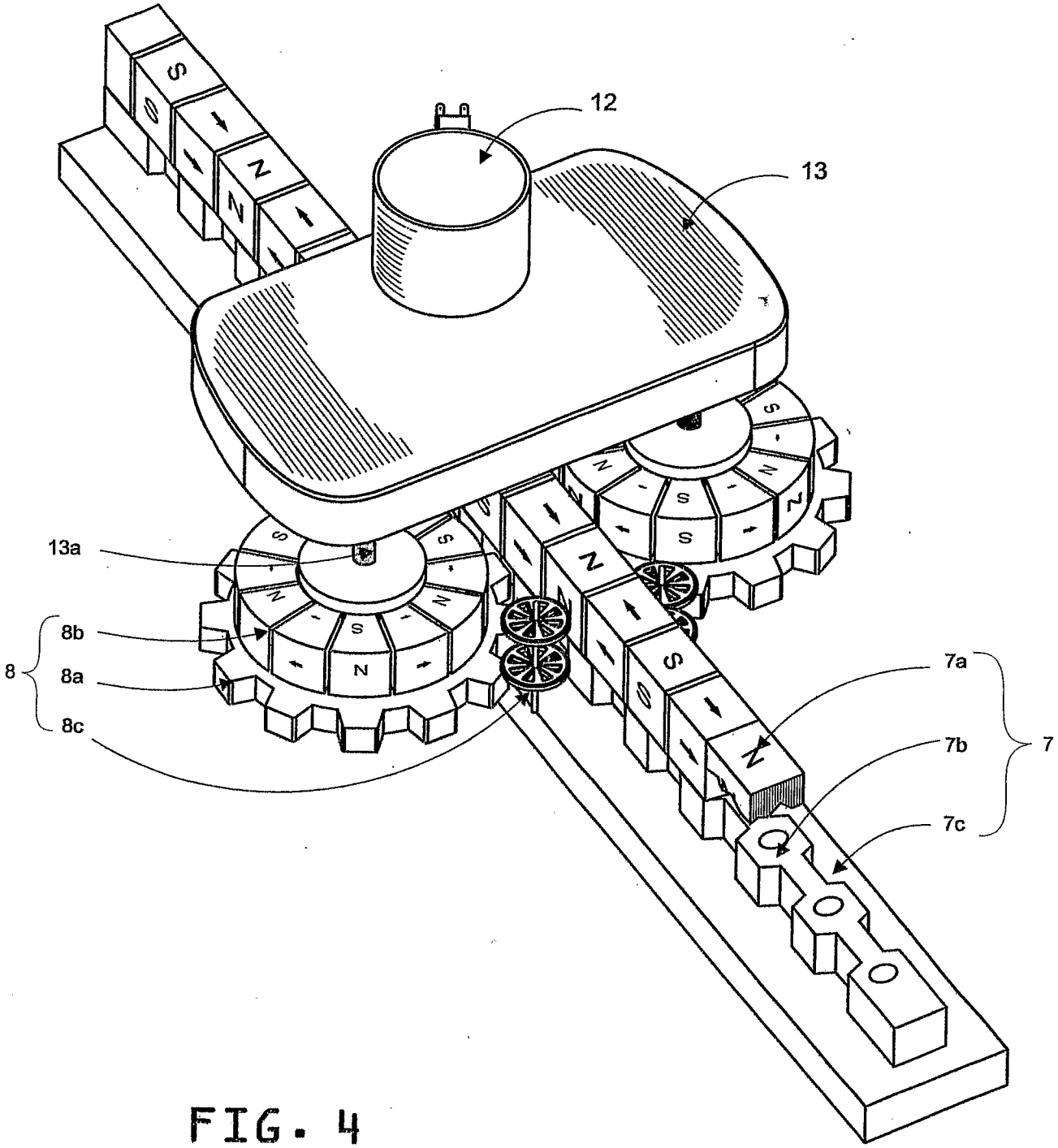

FIG. 4

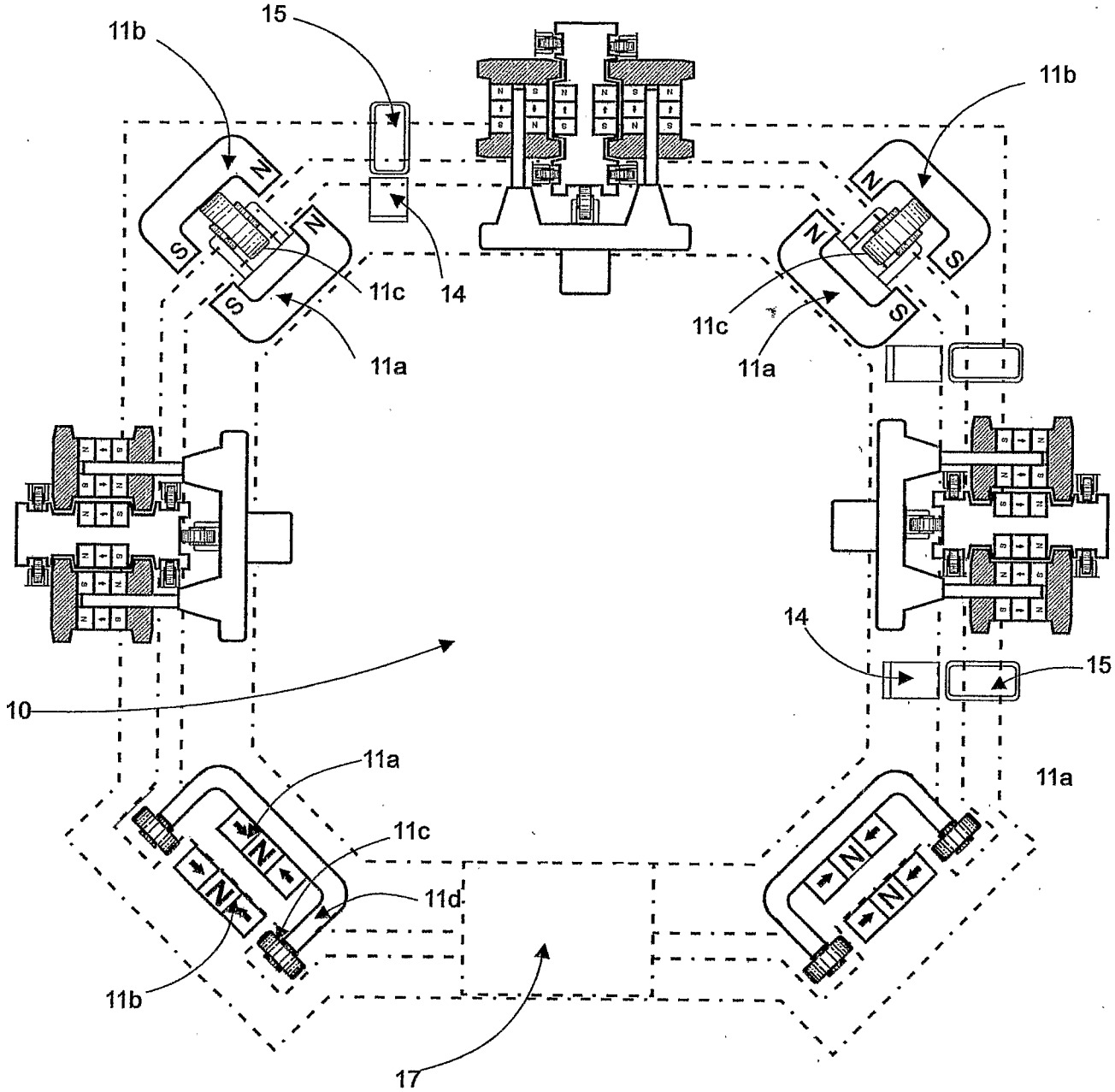

FIG. 5

FIG. 6

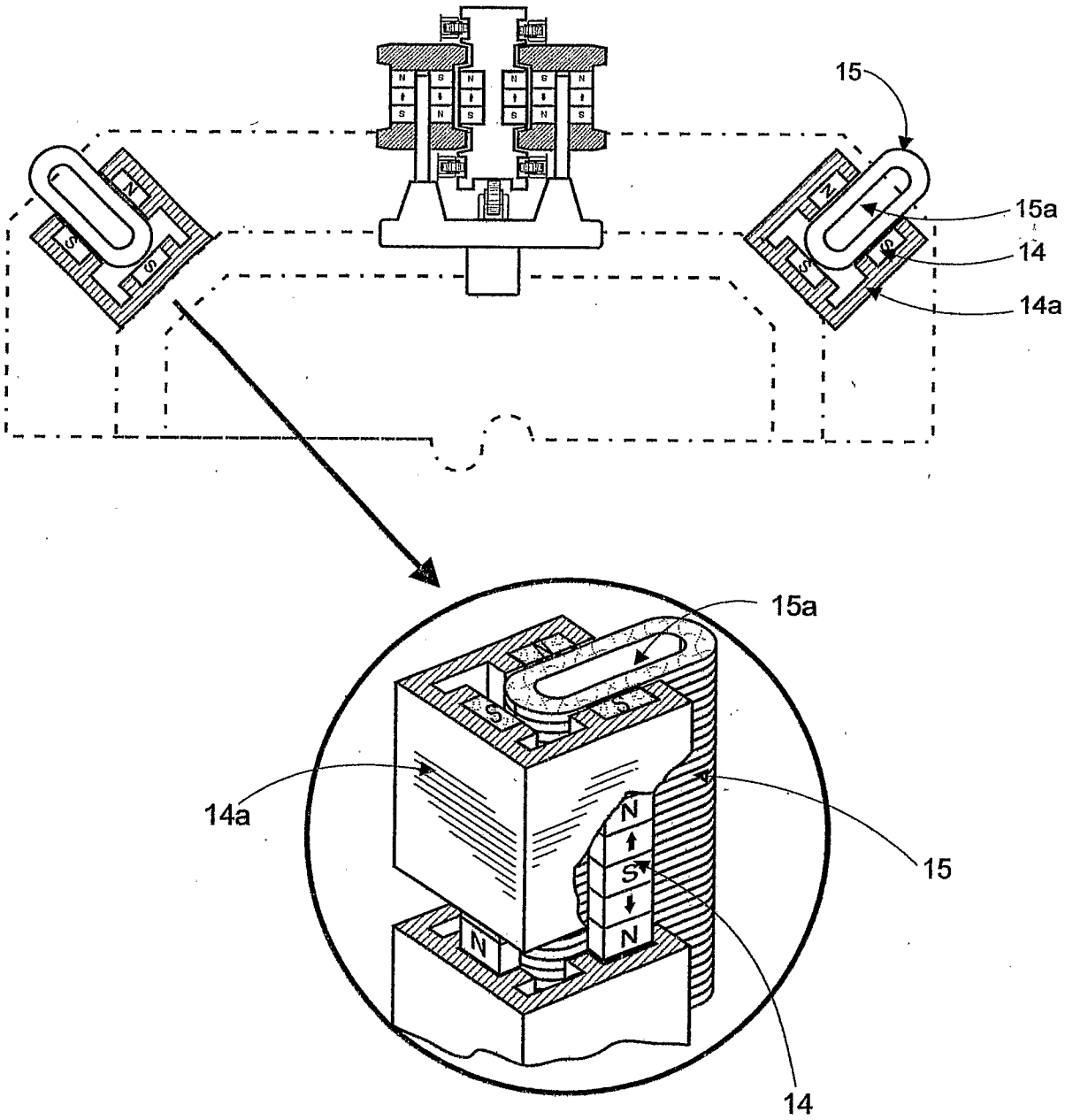

FIGURE 6-A

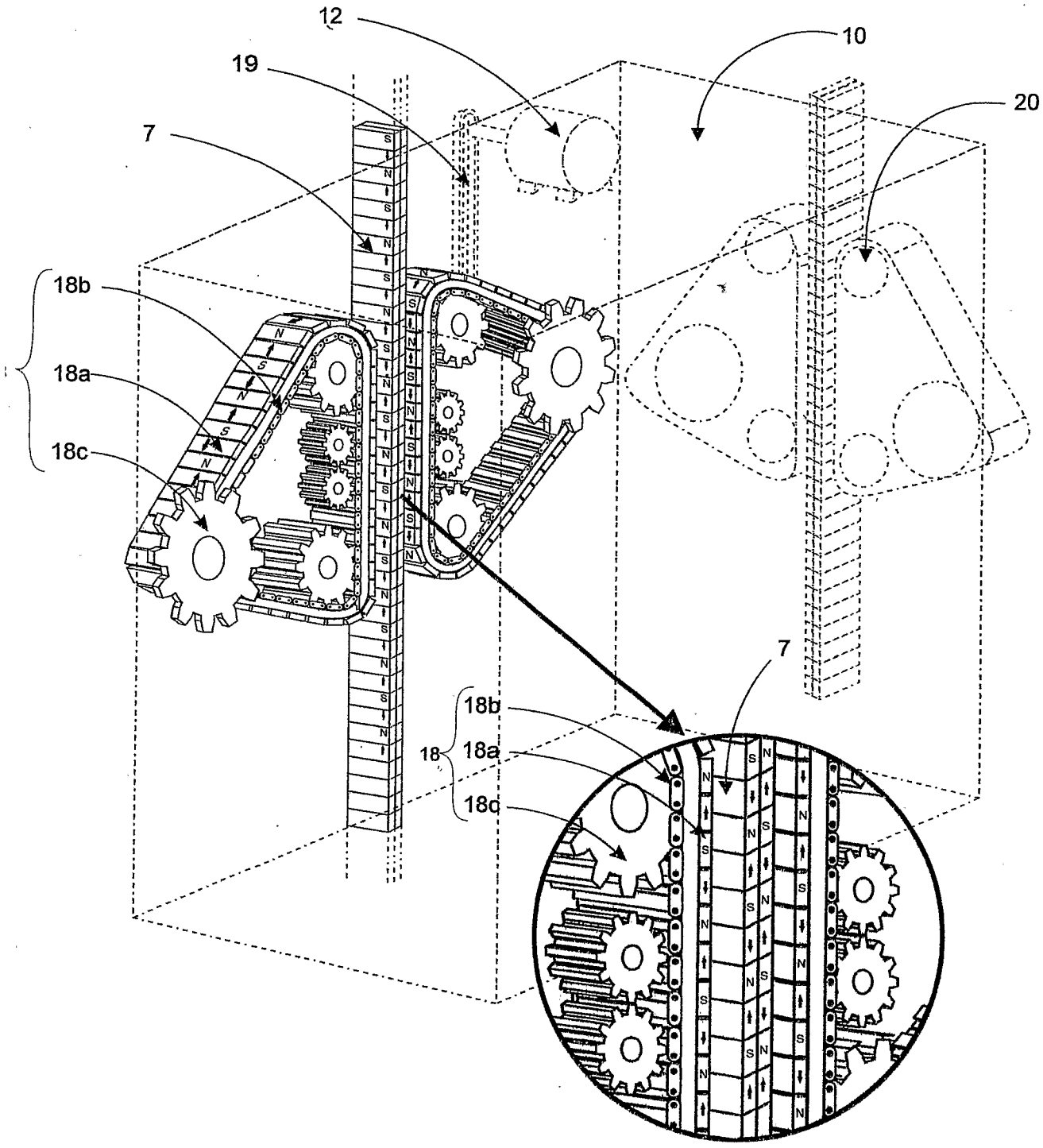

FIG. 7

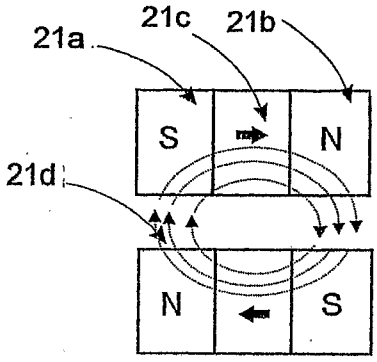

FIG. 8

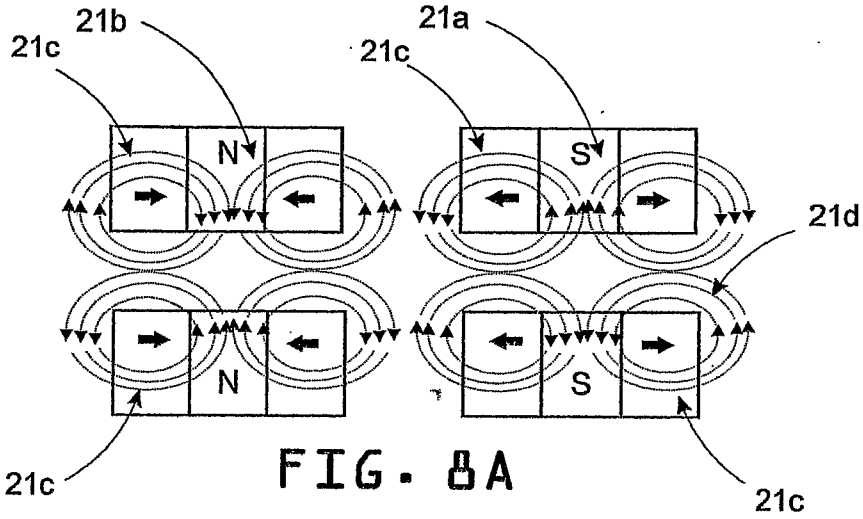

FIG. 8A

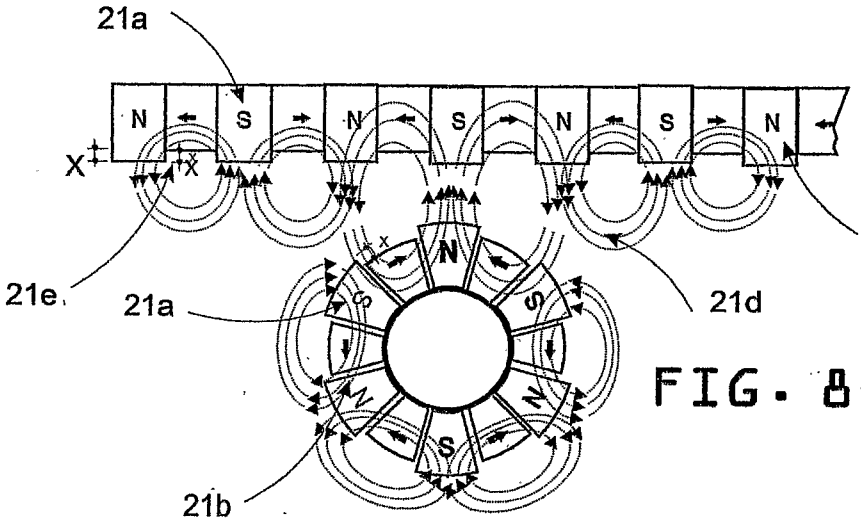

FIG. 8B

FIG. 8C

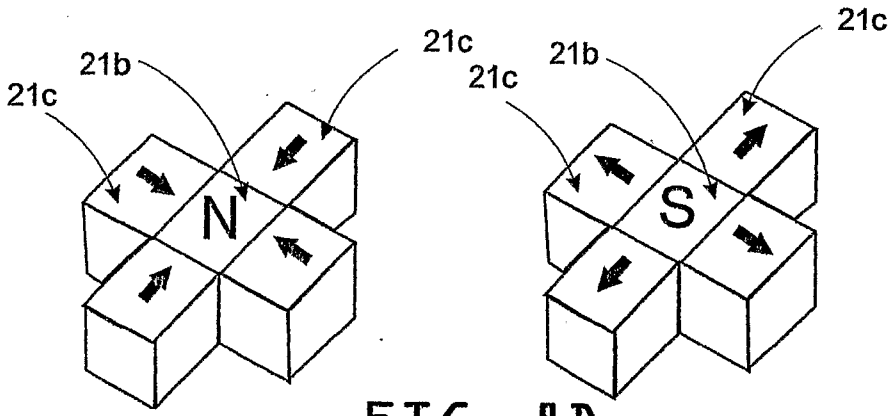

FIG. 8D