Title: HINGE ASSEMBLY FOR A WING MEMBER

Abstract: A hinge assembly (1) includes a first assembly, second assembly, third assembly and fourth assembly being operatively connected to a closure, gate or wing member (2) to allow the wing member to be opened and closed and being supported by a vertical support. The first assembly includes a hinge assembly which includes a first base member (10), stay member (11), 15) and second base member (12) being operatively connected to each other to allow the wing member to open and close to specific positions. The second assembly includes a first hinge (assembly 15) being operatively connected to a lower part of the wing member to allow both vertical and horizontal rotation there about. The third assembly includes a slider assembly including a sliding housing (16), rod member (17), and housing base (18) being operatively connected (20) together. The fourth assembly includes a second hinge assembly (20) being operatively connected to an upper part of the wing member, to allow a bottom of the wing member to slide out by vertically pivoting about the second hinge assembly. The assemblies are constructed and connected to the wing member to allow both vertical and horizontal rotation planes and any variation on such rotation planes as caused by the wing member needing to open and close at least over uneven ground or floor. The stay assembly which includes first and second base members (10) and (12) and stay member (11), extends between the first and second base members and is rotatably connected at its end by rotatable connection thereto, to allow at least horizontal rotation there about the ends wherein the first base member is adjustably and rotatably connected to a support and the second base member is adjustably (30) and rotatably connected to the gate and is not connected to the slider assembly, to be located on the gate at a horizontal distance spaced from the first hinge assembly, with the stay member forming an angle from a face of the wing member to the vertical support.
Hinge Assembly for a Wing Member

The invention relates to a hinge assembly for opening and closing a wing member on sloping ground and to a method of installation. The invention is directed particularly but not solely towards a hinge assembly which is adapted to allow a gate to both rotate and rise or drop at the same time which the gate is opened and closed over uneven or contoured ground.

Background of Invention

Hinges have been around for many years to allow movement of a wing member including opening and closing a door or gate which is supported by a vertical support such as for example a wall or post. As most doors or gates tend to be inside, the surrounding ground being a floor, is usually substantially level. However outside doors or gates, tend to be located adjacent to ground which is often uneven or sloping. In some cases, it is possible to level the ground but in many cases this is often impracticable or too costly to do.

The biggest problem occurs with ground sloping upwardly in the direction of opening, whereas with ground downwardly sloping ground, the gate will still work to be opened or closed but will have to remain above the ground when being opened which can look a little strange and be harder to restrain or hold in a certain position. However it is particularly difficult to allow a gate to open and close, with upwardly sloping ground or ground with an obstacle that needs to be cleared by the gate.

Some solutions to this can involve complicated machinery or difficult to use equipment which can be costly to purchase, difficult to install and difficult to maintain. In other instances of problems with gates moving over sloping ground, is where a gate's movement is jerky or not smooth, further causing problems with wear and tear on its components, as well as being difficult to manually or automatically manoeuvre. Solutions can include using jokey wheels and springs relying on parts that can easily fail or not work properly causing ongoing maintenance problems. Often these solutions are limited to minor rises and can not easily handle significant slope differences. Also many gate or door or wing assemblies can
be very heavy putting more direct loading on the gate hinge so that such assemblies can also fail or not work properly.

In this specification unless the contrary is expressly stated, where a document, act or item of knowledge is referred to or discussed, this reference or discussion is not an admission that the document, act or item of knowledge or any combination thereof was at the priority date, publicly available, known to the public, part of common general knowledge; or known to be relevant to an attempt to solve any problem with which this specification is concerned.

**Object of the Invention**

It is an object of the invention to provide a hinge assembly for a wing member and method of installation that ameliorates some of the disadvantages and limitations of the known art or at least provide the public with a useful choice.

**Summary of Invention**

In a first aspect the invention resides in a hinge assembly 1 which includes a first assembly, second assembly, third assembly and fourth assembly being operatively connected to a closure, gate or wing member 2 to allow the wing member to be opened and closed and being supported by a vertical support, the first assembly includes a stay assembly which includes a first base member 10, stay member 11, and second base member 12 being operatively connected together to allow the wing member to open and close to specific positions, the second assembly includes a first hinge assembly 15 being operatively connected to a lower part of the wing member allow both vertical and horizontal rotation there about, the third assembly includes a slider assembly including slider housing 16, rod member 17, and housing base 18 being operatively connected together, the fourth assembly includes a second hinge assembly 20 being operatively connected to an upper part of the wing member, to allow a bottom of the wing member to slide out by vertically pivoting about the second hinge assembly, the first, second, third and fourth assemblies are constructed and connected to the wing member to allow both vertical and horizontal rotation planes and any variation on such rotation planes as caused by the wing member needing to open and close over uneven ground or floor, wherein the stay assembly which includes first and second base members 10 and 12 and stay member 11 extend between the first and second base members and is rotatably connected at its end by rotatable connection thereto, to
allow at least horizontal rotation there about the ends wherein the first base member is
adjustably and rotatably connected to a support eg the ground or floor near the beginning of
but spaced from the gate ie not interfering with movement of the gate and the second base
member is adjustably and rotatably connected to the gate and is not connected to the slider
assembly, to be located on the gate at a horizontal distance spaced from the first hinge
assembly, with the stay member forming an angle from a face of the wing member to the
vertical support.

Preferably the rotatable connection includes an eyelet shaped located at each end of the stay
member which includes a bearing member with a central aperture to allow a threaded
fastener to be slid there through and be locked in position in the slot but be rotatable in at
least one direction, to a base member.

Preferably, the slider assembly which includes a slider housing 16 which includes a
cylindrical shaped housing for the sliding movement of a rod member 17 therein, and
housing base 18 is shaped as elongate member having a curved inner surface to house slider
housing and a fastening member to allow fastening to the bottom edge of the wing member.

Preferably, the slider housing includes a slider bracket attached or connected to one end of
the rod member which is connected to the hinge assembly and to the wing member, to allow
substantially vertical rotation thereabout when the bottom of the wing member rotates
upwardly or vertically whereby the slider housing slides along the rod member wherein the
slider bracket is L shaped having arms with one arm fixed to an end of rod member and the
other arm with protruding fastener connected to the first hinge assembly and in use is
oriented on its side.

Preferably the slider assembly includes a slider housing 16, rod member 17, housing base 18
and power or actuating means, the power means is provide as a powered actuator which is
located within the slider housing which is an elongate tubular body with an inner gear and
outer gear which telescope with respect to each rotatably rotate about the fixed hinge, to then
enable the power actuator device to move the gate to be open or closed, about both rotatable
ends of the stay member 11 to vertically push out the bottom of the gate with respect to the
top portion of the wing member which remains close to the wall or post whereby the housing
base 18 is attached to the wing member.

Preferably, there is at least one washer located between the slider bracket member and gate
backing bar and respective block members of the first and second hinge assemblies, to allow
vertical sliding movement there between.

Preferably, the first and second hinge assemblies each include a bracket member, hook
shaped member and block shaped member, the bracket member having at least a vertical
portion, attachable to the vertical support or wall, first block member including
interconnected horizontal and vertical cylindrical elongate slots, wherein the block is slidably
attached by its vertical slot to a vertical or upwardly protruding portion of the hook shaped
member which functions to provide horizontal rotation there about by the wing member and
the block is slidably attached to the wing member by its horizontal slot slidably mounted to a
horizontal protruding portion mounted on the wing member, to provide the vertical rotation
of the wing member there about the horizontal protruding portion.

Preferably, the vertical portion of the hook shaped member includes an elongate protruding
portion having an outer peripheral groove which when assembled with the first block, which
such groove forms part of the horizontal cylindrical slot whereby a fastener (eg pin or bolt)
when slidably inserted in horizontal slot will cause the block to be locked in place to prevent
unwanted upwards movement of the gate from each hinge assembly.

Preferably, the bracket of the first hinge member is L shaped bracket member having a
horizontal portion adapted to be attachable to the ground.

Preferably, the first hinge assembly is located adjacent the slider assembly

Preferably, the second hinge assembly is located adjacent the top of the wing member.

Preferably, each hook shaped member include the horizontal portion being formed of a
rectangular cross sectional shaped elongate member and the vertical portion being a
cylindrical or circular cross sectional rod upwardly protruding portion.
Preferably, the slider assembly is located adjacent the stay assembly and first hinge assembly.

Preferably, the stay member, rod member, and fasteners can be formed of stainless steel.

Preferably, the base housing is formed of plastics.

In a second aspect the invention resides in a method of installation of the hinge assembly of the present invention, the method includes the steps of:

1. Position and affix the first hinge assembly at base of the wing member and vertical support;
2. Position and affix the second hinge assembly at top of the wing member and the vertical support;
3. Assemble the slider assembly;
4. Attach the (bracket of) the slider assembly to a bottom side of the end of the wing member adjacent to the first hinge assembly;
5. Position (first bracket or first base member 10 of) the stay assembly to ground or floor adjacent to a hinge end of the wing member;
6. Hang and affix the wing member onto both the first and second hinge assemblies;
7. Position and affix (second bracket or second base member 12 of) the stay assembly, to the wing member at a distance from the end of the wing member and below the stay assembly;
8. Attach stay member 11 at both ends, whereby the wing member is able to open and close by horizontal rotation and vertical rotate pivoting about the second hinge assembly, as required.

In a third aspect the invention resides in a hinge assembly 1 which includes a bracket member, hook shaped member and block shaped member, the bracket member having at least a vertical portion, attachable to a vertical support or wall, first block member including interconnected horizontal and vertical cylindrical elongate slots, wherein the block is slidably attached by its vertical slot to a vertical or upwardly protruding portion of the hook shaped member which functions to provide horizontal rotation there about by the wing member and
the block is slidably attached to the wing member by its horizontal slot slidably mounted to a
horizontal protruding portion mounted on the wing member, to provide the vertical rotation
of the wing member there about the horizontal protruding portion, the vertical portion of the
hook shaped member includes an elongate protruding portion having an outer peripheral
groove which when assembled with the first block, which such groove forms part of the
horizontal cylindrical slot whereby a fastener (eg pin or bolt) when slidably inserted in
horizontal slot will cause the block to be vertically locked in place to prevent unwanted
upwards movement of the gate from each hinge assembly while still allowing vertical and
horizontal rotation.

Preferably, each hinge assembly includes at least one washer located between the bracket
member and block member to allow sliding movement there between.

**Brief Description**

The invention will now be described, by way of example only, by reference to the
accompanying drawings:

**Figure 1** is a front perspective view in accordance with a first preferred embodiment of the
invention in use affixed to a wing member such as a gate in a closed configuration.

**Figure 2** is a front perspective view of the hinge assembly attached to an open gate.

**Figure 3** is a rear view of the hinge assembly and open gate

**Figure 4** is an exploded perspective view of the stay assembly

**Figure 5** is an exploded perspective view of the slider assembly and first hinge assembly

**Figure 6** is a front view of the hinge assembly and gate closed.

**Figure 7** is a rear view of the hinge assembly and gate closed.

**Figure 8** is a bottom plan view of the hinge assembly with gate closed.

**Figure 9** is a top plan view of the hinge assembly and gate closed.

**Figure 10** is a rear end view of the hinge assembly and gate closed.

**Figure 11** is front end view of the hinge assembly and gate closed.

**Figure 12** is front perspective view of the hinge assembly and gate closed, with a motorized
actuator.
**Figure 13** is an end cross section of the slider assembly of figure 12 showing the fixing of the housing to the lower horizontal member of the wing member (e.g. gate)

**Description of Drawings**

The following description will describe the invention in relation to preferred embodiments of the invention, namely a hinge assembly 1 and method of installation. The invention is in no way limited to these preferred embodiments as they are purely to exemplify the invention only and that possible variations and modifications would be readily apparent without departing from the scope of the invention.

Figures 1-13 show hinge assembly 1 which includes the following components including a first assembly, second assembly, third assembly and fourth assembly being operatively connected to a closure or wing member 2 such as a gate or door which is to be opened or closed over uneven or contoured ground or floor, by being supported by a vertical support such as for example a wall or post. The first assembly is positioned below second assembly which is vertically below the fourth assembly. All assemblies are located and movably affixed between one end of closure member 2 and support 3. First second and third assemblies are located close to each other whereas the fourth assembly is spaced upwardly further from the second and third assembly than the second is to the first assembly. In this example, wing member 2 can be a gate comprising in use an at least substantially vertical frame or planar vertical member having a bottom 4, top 5 and 6 ends, and substantially vertical support 3 can be a wall or part of a wall, post or column, as located on a substrate 7 which can be ground, floor which can be sloping or level.

The first assembly is a stay assembly which includes a first base member 10, stay member 11, and second base member 12. The second assembly includes a first hinge assembly 15, the third assembly including slider assembly including slider housing 16, rod member 17, and housing base 18. Fourth assembly includes a second hinge assembly 20.

**First assembly - stay assembly**

First assembly includes a first arm base member 10 is shaped and adapted to provide an elongate shaped strip member being slotted with a first slot 22, with fixing apertures 23 at each end to allow suitable fasteners to be inserted therein to affix first arm base member 10
to substrate 7. In this example substrate 7 can be any shape or elevation such as being substantially horizontal such as a concrete or timber slab.

Stay member 11 includes an elongate shaped member such as a rod or tube having rotatable connection ends 26 and being length adjustable at each end such as for example by threaded ends with nuts. As seen in the figures stay member 11 is oriented to extend between the first base member 10 and second base member 12 in an angle ie from the face of the wing member to position of the vertical support.

For first base member 10, one end 26 is fastened by first fasteners 28 to any position within a adjustment means which is for example a first slot 22 to be positioned and fixed but be rotatable by suitable rotation member thereabout, being fastened directly to the ground or floor adjacent the wall or post. Optionally this ground fixing could also be fitted to a lowest point of the wall if necessary.

Second base member 12 is an elongate shaped member being formed as strip member with an adjustment means eg a second slot 30 there along, able to be fastened by fastening means 31 directly to the gate 2 (eg to the bottom of the gate) and not directly or indirectly to the slider assembly and is spaced substantially horizontally and in line from the first hinge assembly.

The rotation members can include forming each end of the stay member 31 with an eyelet having an aperture there through for a circular bearing (eg ball and socket with multiple movement allowed) and inner aperture for a threaded fastener to extend there through to first base member 10. Means can also be included for both ends to allow lubrication to be externally or internally injected. The rotatable connection at both ends allows for mainly substantially horizontal rotation and also in other planes while allowing the gate 2 to rotate and pivot as it is being opened or closed over contoured ground or floor.

As shown in the figures, first base member 10 is positioned on substrate 7 immediately adjacent to vertical support 6 but spaced from the end 6 of the gate 5.

Second assembly - first or lower hinge assembly
Second assembly includes a lower hinge assembly or first hinge assembly 15 which is attachable to vertical support 3 adjacent to end 6 of the gate 2. First hinge assembly includes a bracket or hinge bracket 35, a hook shaped member or first hook shaped 36 and a block member or first block member 37.

Hinge bracket 35 can be an L shaped plate member in cross section having in use at least a first vertical portion 40 and first horizontal portion 41, and hook shaped member 36 is also L shaped solid elongate member with a vertical protruding up-stand portion 43 and horizontal leg portion 44 connected to first vertical portion 40 of bracket 35. First vertical portion 43 also includes a first peripheral groove 45 located along its length or height but extends horizontally as an outer peripheral groove. Horizontal leg portion 44 includes fastening means to allow fixing to any vertical support like for example a concrete or timber wall or post. Fastening means includes providing at least one aperture there through for a suitable substrate fastening. First horizontal portion 41 of the bracket can include at least one aperture for fastener(s) or attachment to a substrate such as ground or floor 7

First block member 37 is square or rectangular cube member formed having a first vertical block slot 46 and first horizontal block slot 47 which intersects with first vertical block slot 46, whereby the diameter of first horizontal slot 47 is less in dimension than the diameter of the first vertical slot 46, and first horizontal slot 47 has a cylindrical hollow shape with an aperture there along which opens into a cylindrical hollow shape of first vertical slot 46.

**To assemble the lower hinge assembly**, first vertical slot 46 of first block member 37 is slid over first vertical up stand portion 43, whereby first horizontal groove 45 of first vertical portion 43 of first hook member intersects and merges with first horizontal slot 47 to form a complete circular cylindrical slot. Fastener 54 is slid through first horizontal slot 47 of first block member 37 and through first peripheral groove 45 whereby the body of fastener 54 the nut is then threaded onto fastener 54 to fasten the first block member 37 with the gate 5 to the hinge assembly 3 and wall support 6. Plastic washer 55 is slid over the end of fastener 52 to be located between the hinge assembly and end of the slider assembly to allow sliding vertical movement of the gate.

**Third Assembly - slider assembly**
Rod member 17 is an elongate rod or tubular member having a length and length axis, with ends 51. One end 51 includes a fixing end which includes an L shaped slider bracket member 52 being horizontally oriented ie on its side, with a first arm 52A joined or connected at right angles to the length axis to end 51 and second arm 52B at right angle so the first arm, having at least one aperture 53 to allow a fastener assembly 54 to be inserted therein there through to first horizontal block slot 47. The other end 51 of rod member 17 in use extends to protrude parallel with the side of the gate. Fastener assembly 54 includes a substantially horizontally mounted bolt with nut and washer 55. Washer 55 which can be formed of a plastics to allow for sliding movement of the gate and slider, in use is positioned between second arm of slider bracket 52 and side of first block member 37 to allow vertical sliding rotation there between of the gate with slider about the fastener 54 while the block remains stationary. Anywhere along the length of rod member 17, slider housing 16 is shaped as an elongate substantially cylindrical shaped member having at an inner portion being formed as an elongate shaped cylindrical slider housing slot 56 which is adapted to slidably receive rod member 17 therein.

Housing base 18 is shaped an elongate member having a square U shaped cross section with an outer surface being flat with right angled straight sides comprising a flat base portion 56 and a curved inner surface 57. A housing base fastener 58 which includes at least one fastener, is attached or connected to an outer part of slider housing 16 to affix slider housing 16 to curved inner surface 57 and housing base 18 with its flat base portion 56 abutting a side bottom part of the gate at the end 6.

**Fourth Assembly - Second or upper hinge assembly**

Fourth assembly is an upper hinge assembly which includes a second hinge assembly 20 which is similar in shape and function as the first hinge assembly 15 with some differences. Second hinge assembly includes a vertical base plate member 60 and hook member or second hook shaped member 61, a block member or second block member 62, gate backing bar 63 and fastener 64.

Vertical plate member 60 has apertures there through to allow the base plate member 60 to be fastened to vertical support 6. Second hook member 61 is oriented having a second horizontal portion 61A attached or connected to plate member 60, and second vertical up
stand protruding portion 61B pointing upwards. Gate backing bar 63 and is an elongate
member having ends formed as a plate member, with at least one third slot 66 for separate
fasteners (not shown) therein and fastener 64 horizontally protruding at one end. Fastener 64
can include a threaded bolt without the head but with a hexagonal nut 65 and abutting washer
68 (eg plastics) to be located between gate backing bar 63 and second block member 62.

Gate back bar 63 is adapted to be fastened to one side of gate 2 at the top end 5 as shown
whereby fasteners (not shown) are inserted through slots 66 and into the gate. Second
vertical portion 61B also includes a second peripheral groove 71 located along its length or
height but extending horizontally around its outer perimeter.

Second block member 62 like first block member 37, has a second vertical slot 74 of a
diameter and second horizontal slot 75 having a certain diameter which intersect whereby the
diameter of second horizontal slot 75 is less in dimension than the diameter of the second
vertical slot 74, and second horizontal slot 75 has a cylindrical hollow shape with an aperture
there along which opens into a cylindrical hollow shape of second vertical slot 74.

To assemble the upper hinge assembly, second vertical slot 74 of second block member 62
is slid over second vertical up stand portion 61B, whereby second horizontal groove 71 of
second vertical up stand portion 61B of second hook member intersects and merges with
second horizontal slot 75 to form a complete circular cylindrical slot. Fastener 64 is slid
through second horizontal slot 75 of second block member 62 and through second peripheral
groove 71 whereby the body or end of fastener 64 has the nut 65 thi-eaded on its end to fasten
the second block member 62 with the gate 2 to the hinge assembly 4 and wall support 6.

Rotation and Movement
At the bottom of the gate, horizontal or substantially horizontal rotation occurs at the ends of
stay member 11. Horizontal rotation occurs at each hinge assembly in a vertical plane via
vertical portions of hook members and block. Vertical rotation of the bottom of the gate
occurs at the bottom, between first block member 37 and first vertical portion 40 of bracket
35 whereby the slider assembly with its end bracket rotates about fastener 54 within
horizontal slot 47 within first block member 37 with the first block member 37 remaining
vertically stationery but is able to rotate thereabout.
The stay assembly allows the gate 2 to open and close to specific positions and also allows for any mechanical and/or automatic power actuation operation (e.g. a motorized actuator or motor) if required so is able to allow horizontal rotation about its rotation connection ends 26 which also because of the bearing allows for some rotation in other planes which may not necessarily be entirely or strictly horizontal and/or vertical.

And at the top, where backing plate 63 and back of second block member 62 about fastener 64 in horizontal slot 75 so that vertical rotation of the gate 2 causes the backdng plate 63 with its fastener 64 to vertically rotate about the horizontal slot 75 with the block remaining vertically stationary.

Vertical movement of the bottom of the gate 2 also occurs, pivotally about the second or top hinge assembly, to allow the bottom of the gate to pivot vertically outwardly, by the action of sliding housing 16, sliding along fixed rod member 17 (with one gate end of the fixed rod member 17 attached to first hinge assembly) in response to any sloping, uneven or contoured ground or floor when the gate 2 is rotated open or closed.

As the gate 2 moves and rotates or pivots, the planes of rotation will not necessarily be strictly horizontal and vertical, as variations on these planes is equally possible and can be accommodated by the hinge assembly of the present invention.

**Suggested Method of installation which can include the following steps:**

1. Position and affix the first hinge assembly at the base of the wing member and vertical support;
2. Position and affix the second hinge assembly at the top of the wing member and the vertical support;
3. Assemble the slider assembly;
4. Attach (e.g. bracket of) the slider assembly to the bottom side of an end of the wing member adjacent the first hinge assembly;
5. Position (e.g. first bracket or base member 10 of) the stay assembly to the ground or floor adjacent to a hinge end of the wing member;
6. Hang and affix the wing member onto both the first and second hinge assemblies;
7. Position and affix (eg a second bracket or second base member 12 of) the stay assembly, to the wing member at a distance from end of the wing member and below the stay assembly;

8. Attach stay member 11 at both ends, whereby the wing member is able to open and close by horizontal rotation and vertical rotation pivoting about the second hinge assembly, as required.

This method can easily be rearranged like for example attaching the slider to the gate first or attaching the top hinge before the bottom hinge or by assembling the slider assembly after fitting the stay assembly or even before doing anything else.

**Advantages**

a) Modest cost  
b) Simple installation  
c) Easy to use  
d) Robust construction  
e) Can be used on any sloping or uneven ground or floors  
f) Can be used to avoid any ground obstacles  
g) Adjustable  
h) Can attach motorized apparatus to allow automatic operation  
i) Smooth operation when gate being moved

**Variations**

Throughout the description of this specification, the word "comprise" and variations of that word such as "comprising" and "comprises", are not intended to exclude other additives, components, integers or steps.

It will of course be realised that while the foregoing has been given by way of illustrative example of this invention, all such and other modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as is hereinbefore described.
All the components can be formed of any suitable material such as for example galvanised steel for most parts and plastics for the base member 18 of the slider assembly. Stay member 11, rod member 17 and fasteners can be formed of stainless steel. Slider housing 16 can be formed of a hollow shape with an inner slidable cylindrical sleeve of any suitable material such as a special type of plastics or have suitable lubricated surfaces to facilitate sliding. Block members 37, 62, hook shaped members, stay member 11 and arm member 17 can be hollow or solid as long as they provide cylindrical slots as required. Connections between the components can be by bolting, screwing or welding. The number of slots, bolts, washers and nuts etc can be varied to suit as well as allowing for other forms of connecting such as for example welding or pins.

Though orientations like "horizontal" and "vertical" are used throughout the specification, these need not be strictly horizontal or vertical but only need to be oriented to allow the wing member to rotate both horizontally and vertically as required. With regard to the nook shaped member the horizontal portion may not necessarily be horizontal but of any angle as long as the vertical portion is substantially vertical to allow wing member rotation.

It will also be understood that where a product, method or process as herein described or claimed and that is sold incomplete, as individual components, or as a "kit of Parts", that such exploitation will fall within the ambit of the invention.

Hook shaped member can be formed of rectangular solid bar as the horizontal portion and solid rod as the vertical portion. Numbers of fasteners, apertures nuts and washers and sizes of all materials or components can be varied to suit the terrain and type of gate required. Furthermore operation of the gate or hinge assembly can be by hand or by remote control with motorization action which can include attaching a suitable motor on the gate or hinge assembly.

As shown in figure 12 the third assembly includes a slider assembly including slider housing 16, rod member 17, housing base 18 and power or actuating means. The power means can formed as at least one powered actuator. The power actuator device (eg a motor with interworking gears to link directly with the or be formed as inner and outer threaded elongate parts) can be located within the slider housing which is an elongate tubulai body which also includes an inner gear and outer gear which telescope with respect to each rotatably about
the fixed hinge, to then enable the power actuator device to move the wing member (eg gate) to be open or closed, about both rotatable ends of the stay 11 to push out the bottom of the gate with respect to the top portion which remains close to the wall or post.

This is just one position that the power actuating device can be placed as other positions or in more than one position which are equally possible if desired or required. The housing base of the slider assembly is shown as being cylindrical but can be equally, square or any shape that able to house all its components. The power actuator device can be powered by both mains power, battery or by solar power with or not with remote operating capabilities.

As seen in figure 13 in an end cross section view from looking at the end of rod 17, the housing base 18 can be simply be slid onto a base part 18a which is fixed directly to the vertical face of the lower horizontal part or rail 4 of the gate. Housing base 18 is shown having a forward square hollow elongate housing 18a with a rear facing slot portion which horizontally slides onto a matching male part which is fixing by fixing means 18b to rail 4. A suitable washer 18c can be used between the fixing means and rail 4. This allows the gate to be manually operated if necessary by allowing disengagement at the sliding parts of the housing.

These and other features and characteristics of the present invention, as well as the method of operation and functions of the related elements of structures and the combination of parts and economics of manufacture, will become more apparent upon consideration of the following description, with reference to the accompanying drawings, all of which form part of this specification, wherein like reference numerals designate corresponding parts in the various figures.

It is acknowledged that the term 'comprise' may, under varying jurisdictions, be attributed with either an exclusive or an inclusive meaning. For the purpose of this specification, and unless otherwise noted, the term 'comprise' shall have an inclusive meaning - i.e. that it will be taken to mean an inclusion of not only the listed components it directly references, but also other non-specified components or elements. This rationale will also be used when the term 'comprised' or 'comprising' is used in relation to one or more steps in a method or process.
For purposes of the description hereinafter, the terms "upper", "lower", "right", "left", "vertical", "horizontal", "top", "bottom", "lateral", "longitudinal", "side", "front", "rear" and derivatives thereof shall relate to the invention as it is oriented in the drawing figures. However it is to be understood that the invention may assume various alternative variations, except where expressly specified to the contrary. It is also to be understood that the specific devices illustrated in the attached drawings, and described in the following specification are simply exemplary embodiments of the invention. Hence specific dimensions and other physical characteristics related to the embodiments disclosed herein are not to be considered as limiting.
What we claim is:

Claim 1: A hinge assembly 1 which includes a first assembly, a second assembly, a third assembly and a fourth assembly being operatively connected to a closure, gate or wing member 2 to allow the wing member to be opened and closed and being supported by a vertical support, the first assembly includes a stay assembly which includes a first base member 10, stay member 11, and second base member 12 being operatively connected together to allow the wing member to open and close to specific positions, the second assembly includes a first hinge assembly 15 being operatively connected to a lower part of the wing member allow both vertical and horizontal rotation there about, the third assembly includes a slider assembly including slider housing 16, rod member 17, and housing base 18 being operatively connected together, the fourth assembly includes a second hinge assembly 20 being operatively connected to an upper part of the wing member, to allow a bottom of the wing member to slide out by vertically pivoting about the second hinge assembly, the first, second, third and fourth assemblies constructed and connected to the wing member to allow both vertical and horizontal rotation planes and any variation on such rotation planes as caused by the wing member needing to open and close over uneven ground or floor, wherein the first and second base members 10 and 12, and stay member 11, extend between the first and second base members and is rotatably connected at its end by rotatable connection thereto, to allow at least horizontal rotation there about the ends wherein the first base member is adjustably and rotatably connected to a support on the ground or floor near and spaced from the beginning end of the gate and the second base member is adjustably and rotatably connected to the gate and is not connected to the slider assembly, to be located on the gate at a horizontal distance spaced from the first hinge assembly, with the stay member forming an angle from a face of the wing member to the vertical support.

Claim 2: A hinge assembly as set out in claim 1, wherein the rotatable connection includes an eyelet shaped located at each end of the stay member which includes a bearing member with a central aperture to allow a threaded fastener to be slid there through and be locked in position in the slot but be rotatable, to a base member.
Claim 3: A hinge assembly as set out in claim 1, wherein the slider assembly includes a slider housing 16 which includes a cylindrical shaped housing for the sliding movement of a rod member 17 therein, and housing base 18 is shaped as elongate member having a curved inner surface to house slider housing and a fastening member to allow fastening to a bottom edge of the wing member.

Claim 4: A hinge assembly as set out in claim 3, wherein the slider housing includes a slider bracket attached or connected to one end of the rod member which is connected to the hinge assembly and to the wing member, to allow substantially vertical rotation thereabout when the bottom of the wing member rotates upwardly or vertically whereby the slider housing slides along the rod member wherein the slider bracket is L shaped having arms with one arm fixed to an end of rod member and the other arm with protruding fastener connected to the first hinge assembly and in use is oriented on its side.

Claim 5: A hinge assembly as set out in claim 1 wherein the slider assembly includes a slider housing 16, rod member 17, housing base 18 and power or actuating means, the power means is provide as a powered actuator which is located within the slider housing which is an elongate tubular body with an inner gear and outer gear which telescope with respect to each rotatably rotate about the fixed hinge, to then enable the power actuator device to move the gate to be open or closed, about both rotatable ends of the stay member 11 to vertically push out the bottom of the gate with respect to the top portion of the wing member which remains close to the wall or post whereby the housing base 18 is attached to the wing member.

Claim 6: A hinge assembly as set out in claim 1, wherein there is at least one washer located between the slider bracket member and gate backing bar and respective block members of the first and second hinge assemblies, to allow vertical sliding movement there between.

Claim 7: A hinge assembly as set out in claim 1, wherein the first and second hinge assemblies each include a bracket member, hook shaped member and block shaped member, the bracket member having at least a vertical portion, attachable to the vertical support or wall, first block member including interconnected horizontal and vertical cylindrical
elongate slots, wherein the block is slidably attached by its vertical slot to a vertical or upwardly protruding portion of the hook shaped member which functions to provide horizontal rotation there about by the wing member and the block is slidably attached to the wing member by its horizontal slot slidably mounted to a horizontal protruding portion mounted on the wing member, to provide the vertical rotation of the wing member there about the horizontal protruding portion.

Claim 8: A hinge assembly as set out in claim 1, wherein the vertical portion of the hook shaped member includes an elongate protruding portion having an outer peripheral groove which when assembled with the first block, which such groove forms part of the horizontal cylindrical slot whereby a fastener when slidably inserted in horizontal slot will cause the block to be locked in place to prevent unwanted upwards movement of the gate from each hinge assembly.

Claim 9: A hinge assembly as set out in claim 1, wherein the bracket of the first hinge member is a L shaped bracket member having a horizontal portion adapted to be attachable to the ground.

Claim 10: A hinge assembly as set out in claim 1, wherein the first hinge assembly is located adjacent the slider assembly

Claim 11: A hinge assembly as set out in claim 1, wherein the second hinge assembly is located adjacent the top of the wing member.

Claim 12: A hinge assembly as set out in claim 1, wherein each hook shaped member include the horizontal portion being formed of a rectangular cross sectional shaped elongate member and the vertical portion being a cylindrical or circular cross sectional rod upwardly protruding portion.

Claim 13: A hinge assembly as set out in claim 1, wherein the slider assembly is located adjacent the stay assembly and first hinge assembly.
Claim 14: A hinge assembly as set out in claim 1, wherein the stay member, rod member, and fasteners can be formed of stainless steel.

Claim 15: A hinge assembly as set out in claim 1, wherein the base housing is formed of plastics.

Claim 16: A method of installation of the hinge assembly as claimed in at least claim 1, wherein the method includes the steps of:

1. Position and affix the first hinge assembly at the base of the wing member and vertical support;
2. Position and affix the second hinge assembly at the top of the wing member and the vertical support;
3. Assemble the slider assembly;
4. Attach the slider assembly to bottom side of end of the wing member adjacent first hinge assembly;
5. Position the first base member 10 of the stay assembly to the ground or floor adjacent to the first hinge assembly end of the wing member;
6. Hang and affix the wing member onto both the first and second hinge assemblies;
7. Position and affix the second base member 12 of the stay assembly, to the wing member at a distance from an end of the wing member and below the stay assembly;
8. Attach stay member 11 at both ends, whereby the wing member is able to open and close by horizontal rotation and vertical rotation pivoting about the second hinge assembly, as required.