July 29, 1952 T. F. ANDERSON ET AL 2,604,654

HINGE ASSEMBLY FOR SWINGING DOORS

Filed June 26, 1948 3 Sheets-Sheet 1

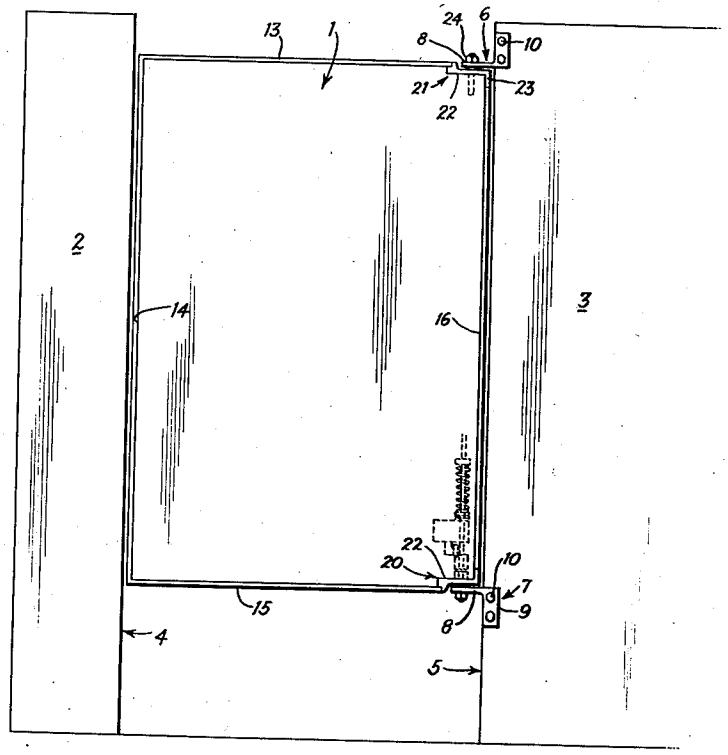


Fig. 1

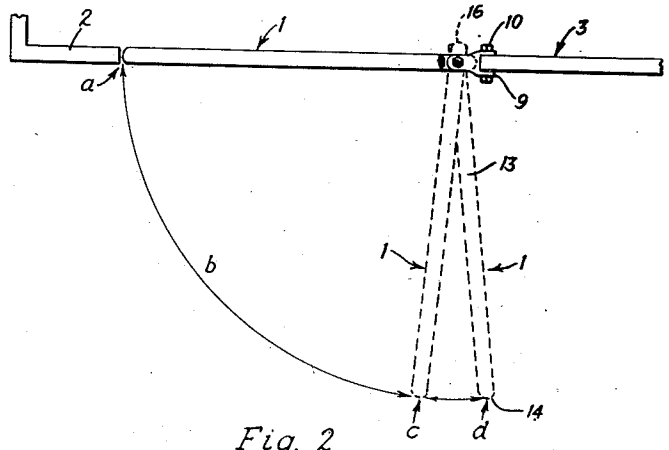


Fig. 2

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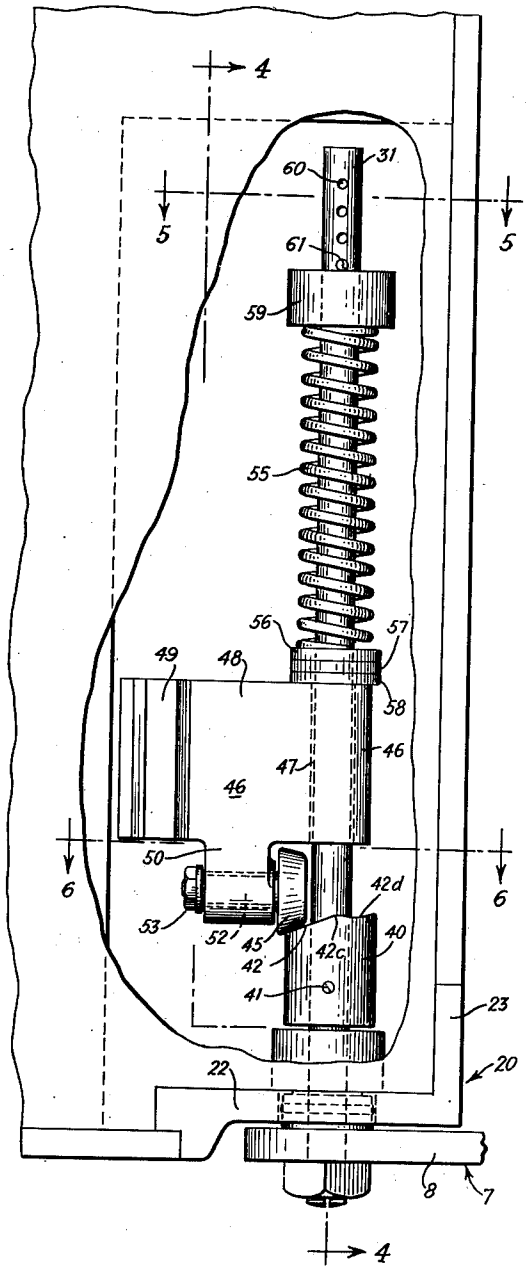


Fig. 3

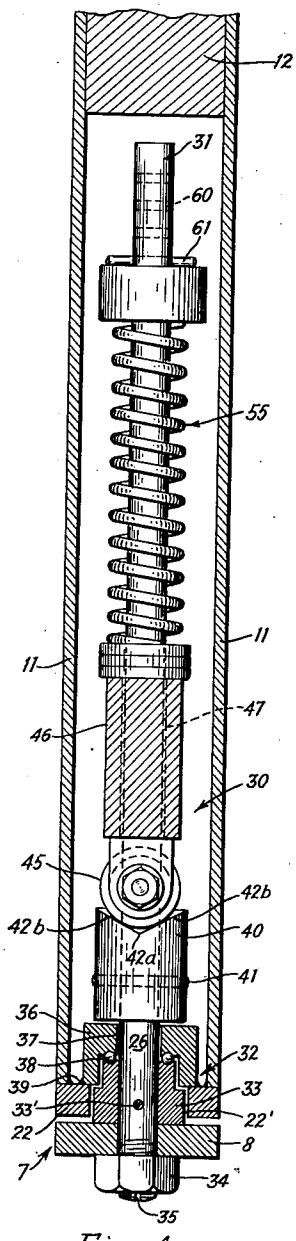


Fig. 4

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Filed June 26, 1948 3 Sheets-Sheet 3

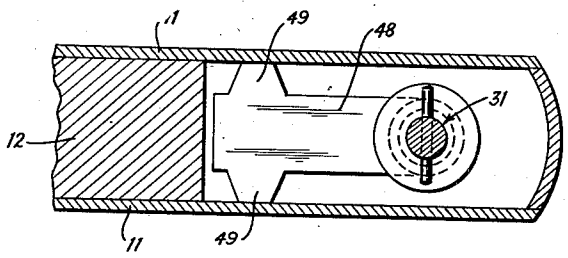


Fig. 5

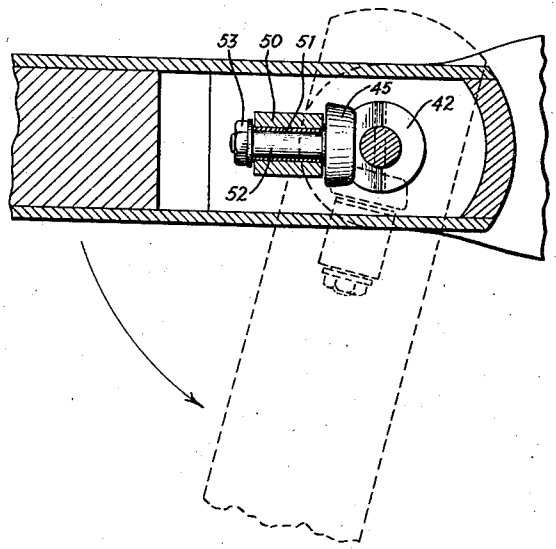


Fig. 6

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HINGE ASSEMBLY FOR SWINGING DOORS

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Application June 26, 1948, Serial No. 35,338

11 Claims. (Cl. 16—186)

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This invention relates to hinge assembly for swinging doors, and more particularly to an improved hinge assembly designed to be concealed within the door structure and yet operate to automatically swing the door to the desired open or closed position.

Gravity hinges as commonly employed, embody a roller mounted on a support attached to the door and designed to roll over an inclined track fixed to the door frame, the door being mounted to have vertical movement to take advantage of gravity force to operate the door. To secure proper gravity action, and the relation necessary between the roller and the inclined cam track, the minimum diameter of the case or housing which encloses the working parts of the hinge should be in the approximate order of two inches or more. The enlarged casing requires that the gravity hinge be mounted below the bottom edge of the door, or set in a notched cutout in the rear edge of the door. Since the hinge casing is exposed to view, it must be chrome plated or finished so that the installation presents a reasonably attractive appearance. Since vertical door movement must be provided for, gravity hinges as presently constructed cannot be used on doors sized to occupy the entire door opening as defined by the door frame.

In the design of toilet partitions, hospital cubicles, service rooms and compartments where sanitation is important, it is highly desirable that the doors and wall surfaces present smooth and regular contours so that they may be easily cleaned and kept sanitary. Gravity hinges heretofore employed, set in exposed position below the lower edge of the door or recessed into the rear edge of the door, present objectionable exposed surfaces and irregularities which gather dirt and are difficult to keep clean.

Door hinge assemblies made in accordance with this invention are constructed to be contained and concealed within the door body. Notching or defacement of the door and door frame is thus avoided. The operating parts of this hinge assembly may be encased and concealed within door bodies of any thickness down to approximately one inch in thickness or less. Mechanism is provided for exerting an impelling force on the door to forcibly swing the door into closed residence position or open residence position, without raising or lowering movement of the door. Thus this improved hinge assembly finds application to numerous types and sizes of doors, and can be used in locations where raising and lowering movement of the door, as occasioned by gravity hinges, is not desirable or permissible.

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Since the operating mechanism of this improved hinge assembly is concealed within the door, the parts thereof do not require special finishing or chrome plating, and are fully protected from dirt and weather deterioration. Means are provided by which the residence position of the door may be accurately adjusted by the simple manipulation of a part thereof exposed at the lower edge of the door. This improved door hinge assembly may be mounted on any type or shape of hinge bracket, permitting a wide latitude in the design of the hinge bracket to harmonize with the door and door frame architecture.

An object of this invention is to provide an improved hinge assembly which overcomes the objectionable features of gravity hinges as commonly used.

Another object of this invention is to provide an improved hinge assembly operative to automatically swing the door with which it is associated to any desired residence position, and constructed to permit concealment of the hinge assembly within the normal thickness of the door body.

Another object of this invention is to provide an improved hinge assembly operative to swing the door with which it is associated to any desired residence position, without causing lowering or raising movement of the door.

Another object of this invention is to provide an improved hinge assembly for swinging doors constructed to permit concealed encasement thereof within the door body, which is operative to urge the door to predetermined residence position without causing raising or lowering movement of the door, which is economical to manufacture and assemble, which can be conveniently and easily installed in the door, and quickly adjusted from a point exterior of the door.

Other objects and advantages of this invention will become apparent as the disclosure proceeds.

Although the characteristic features of the invention will be particularly pointed out in the claims appended hereto, the invention itself, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part hereof, in which

Fig. 1 is an elevational view of a typical door mounted in a door frame by means of the im-

proved hinge assembly constructed in accordance with this invention.

Fig. 2 is a top plan view of the door and door frame as illustrated in Fig. 1, this view showing the door in various positions to indicate the operating characteristics of this improved hinge assembly.

Fig. 3 is an enlarged elevational view of the improved hinge assembly showing the details thereof, parts of the door and the lower hinge bracket being shown in their associated relation to the hinge assembly.

Fig. 4 is an enlarged vertical cross sectional view through the hinge assembly and a fragmentary part of the door and lower hinge bracket, as the same would appear when viewed along line 4—4 of Fig. 3.

Fig. 5 is an enlarged fragmentary cross sectional view of the door and hinge assembly, as viewed along the horizontal section indicated by line 5—5 of Fig. 3; and

Fig. 6 is an enlarged fragmentary cross sectional view of the door and hinge assembly, as viewed along the horizontal section indicated by line 6—6 of Fig. 3.

Similar reference characters refer to similar parts throughout the several views of the drawings and specification.

The improved hinge assembly constructed in accordance with this invention may be associated with almost any type of door and door frame, including doors which occupy the full area of the door opening as defined by the door frame, as well as doors which are variously spaced from the door sill and/or the door head frame. For purposes of illustration there is shown in Fig. 1, one form of door 1 with which this improved hinge assembly may be associated, the door being snugly fitted between the jamb edge 4 of the front frame member 2 and the jamb edge 5 of the rear frame member 3.

The door is hingedly mounted upon an upper hinge bracket 6 and a lower hinge bracket 7 which may be of any desired construction. As illustrated in Fig. 1, each hinge bracket may comprise a horizontal arm 8 having rearwardly projecting spaced wings 9. Bolts 10 extending through the wings 9 and through the rear frame member 3 may be provided to firmly secure the hinge brackets in fixed position. It will be appreciated that the hinge brackets may be of any desired shape or design to provide a support for the hinge pintles, and may be variously secured or attached to the rear frame member.

The door 1 may be constructed in any desired shape and size of metal, wood or other material, and may vary from approximately 1 inch in thickness to two or more inches in thickness. As shown in the drawings for purposes of illustration, the door 1 may comprise a pair of metal side wall forming panels 11 arranged in spaced relationship. The space between the side wall panels 11 may be packed with suitable sound deadening insulation 12, except for the limited space which contains the lower hinge assembly. A top edging section 13, a front edging section 14, a bottom edging section 15 and a rear edging section 16 may be crimped, welded or otherwise formed or secured to the adjacent edges of the side wall panels 11 to provide a strong and sturdy door construction.

The rear corners of the door may be reinforced and strengthened by a bottom corner bracket 20 and a top corner bracket 21 secured to the door structure, the brackets presenting contours which interfit and harmonize with the adjacent door edging sections. Each corner bracket is sturdily constructed and may be formed as a metal casting, presenting a horizontal leg 22 and a vertical leg 23. The horizontal leg 22 may be slightly inset, as shown more particularly in Figs. 1 and 3, so that the horizontal arm 8 of the adjacent hinge bracket will interfit therewith, maintaining the overall height of the door substantially uniform throughout. To attain line symmetry, the horizontal arm 8 of the top hinge bracket 6 may extend in substantially the same plane as the top edging section 13 of the door, and the horizontal arm 8 of the lower hinge bracket 7 may extend in substantially the same plane as the bottom edging section 15 of the door. A neat and symmetrical door construction and door mounting is thus provided in which the projecting horizontal arms 8 of the hinge brackets are contoured within the door dimensions to present smooth flowing lines of attractive appearance.

The upper end of the door 1 may be pivotally secured to the upper hinge bracket 6 by means of a hinge pintle 24 which extends through the horizontal arm 8 of the upper hinge bracket 6 and suitably journaled in the horizontal leg 22 of the upper corner bracket 21 of the door. A simple hinge pintle 24 can be used for this purpose since the lower edge of the door is pivotally supported upon the improved hinge assembly 30 which will now be described.

As shown more particularly in Figs. 3, 4, 5 and 6, the hinge assembly 30 comprises an elongated pintle rod 31 whose lower end extends through the horizontal arm 8 of the lower hinge bracket 7. The fixed bearing section 33 of a thrust bearing 32 embraces the lower end of the pintle rod 31 and is secured thereto as by a suitable key pin 33'. The fixed bearing section 33 freely extends through a suitable opening 22' in the horizontal leg 22 of the lower corner bracket 20. The projecting end of the pintle rod 31 is made to receive a nut 34. When the nut 34 is tightened, the arm 8 of the lower hinge bracket 7 is clamped between the nut 34 and the fixed bearing section 33 in a manner to secure the pintle rod 31 in rigidly fixed position to the bracket arm 8. The exposed end of the pintle rod 31 is provided with a slot 35 to which a screw driver may be applied to permit orientation of the pintle rod 31, when the nut 34 is loosened, for a purpose which will presently appear.

The thrust bearing 32 also includes a rotatable bearing section 36 which is housed between the side wall panels 11 of the door, the rotatable section 36 having a central bore 37 through which the pintle rod 31 freely extends. The bearing section 36 is rotatably supported upon the fixed bearing section 33, as by suitable ball bearings 38, so that the bearing section 36 may freely rotate substantially without friction on the fixed bearing section 33 of the composite thrust bearing 32. The rotatable bearing section 36 is firmly secured, as by welding 39, to the horizontal leg 22 of the lower corner bracket 20. Thus it will be appreciated that the rotatable bearing section 36, fixed to the horizontal leg 22 of door bracket 20, rotates with the swinging movement of the door about the fixed pintle rod 31, the bearing section 33 being fixedly held to the arm 8 of the lower hinge bracket 7 by the tightened nut 34.

A cam track member 40 is fixed to the pintle rod 31 as by a key pin 41, the cam track member 40 being positioned directly above the rotatable bearing section 36 of the thrust bearing 32. The

cam track member 40 may be made in the form of a tubular metal cylinder through which the pintle rod 31 extends, and has a diameter which may be somewhat less than the distance between the side wall panels 11 of the door. The upper face of the cam track member 40 presents a cam track 42 having a depressed valley point 42a and inclined riser faces 42b extending therefrom. Each of the inclined riser faces 42b terminates in a raised crown point 42c which over-rolls into a sunken notch 42d.

A cam roller 45 is provided, designed to roll over the cam track 42 of the cam member 40. The cam roller 45 has a mounting by means of which a substantial swinging thrust will be exerted on the door to move it from open to closed position when the roller 45 travels over the inclined track face 42b of the cam track 42. The mounting means for the cam roller 45 comprises a relatively heavy metal block 46 having a bore 47 through which the pintle rod 31 extends in a manner to permit free sliding and swinging movement of the block 46 on the pintle rod 31. The roller mounting block 46 presents an elongated extension 48 which projects horizontally between the side wall panels 11 of the door for a distance of two or more inches from the pintle rod 31. The extension 48 may be provided with laterally flared wing sections 49, as shown more particularly in Figs. 3 and 5, which are designed to bear against the inside faces of the adjacent side wall panels 11 of the door. Thus it will be appreciated that swinging movement of the door will cause the roller mounting block to pivot on the pintle rod 31.

A bearing lug 50, which may be cast as an integral part of the block 46, extends therefrom in spaced relation to the pintle rod 31. The bearing lug 50 supports a bearing sleeve 51 within which a stub shaft 52 may freely rotate. The cam roller 45 is mounted on one end of the stub shaft 52, the other end of the stub shaft 52 having a suitable bearing nut 53 whereby the stub shaft 52 is held in assembled position in the bearing lug 50. Since the roller supporting block 46 possesses considerable weight, the cam roller 45 will be maintained at all times in rolling engagement with the cam track 42, and the cam roller 45 will freely roll over the cam track 42 with the swinging movement of the door.

When the door is in closed residence position *a*, as indicated in Fig. 2, the cam roller 45 will be at rest at the valley point 42a of the cam track. When the door is forcibly swung through distance *b* to the open position as indicated at *c* in Fig. 2, the cam roller 45 will have travelled up one of the inclines 42b of the cam track to the crown 42c of the cam track as indicated in Fig. 3. The door will not remain at rest in this position when the door is released, but if swung open a further increment, the cam roller 45 will roll into the adjacent open residence depression 42d of the cam track as shown in Fig. 4, at which point the door will have open stability in the position *d* shown in Fig. 2.

It will be noted that the roller mounting block 46 provides a radius arm whereby substantial leverage force may be exerted on the door, even though the track radius of the cam track 42 is relatively small. This radius arm action is augmented by the substantial weight of the block 46 which forms the radius arm, and is further substantially augmented by the provision of a heavy coiled compression spring 55 which embraces the upper portion of the pintle rod 31. The lower end of the spring 55 may rest upon a washer 56 which in turn rests upon a bearing washer 57 which may be of the self-lubricating type, or which may carry a set of ball bearings. A rotatable washer 58 seats against the upper end of the radius block 46 and rotates therewith, the rotatable washer 58 providing a support for the bearing washer 57.

The compression spring 55 may be capped by a heavy cap washer 59 which telescopes over the upper end of the pintle rod 31 and seats against the upper end of the compression spring 55. The upper end of the pintle rod 31 is provided with a plurality of spaced pin holes 60 extending diametrically therethrough, each hole being designed to selectively receive an abutment pin 61. The compression spring 55 may be placed under any desired degree of compression by adjusting the pin-locked position of the cap washer 59.

It will be appreciated that the compression spring 55 may be adjusted to exert substantial downward pressure against the radius block 46, thereby applying a corresponding load on the freely rotatable cam roller 45. The weight of this load is adjusted so that the cam roller 45 will positively roll down the inclined section 42b of the cam track and exert a sufficient swinging force on the radius block 46 to insure positive swinging movement of the door. By a proper proportioning of the weight and size of the parts, and the load pressure exerted by the coil spring 55, a door of very substantial weight can be swung to closed position by the automatic action of this improved hinge assembly. Forcible swinging movement of the door toward open position drives the roller up the incline cam track section 42b, thereby further compressing the compression spring 55 to a point where the door will automatically swing to closed residence position or open residence position as desired.

Means are provided to adjust the hinge mechanism to maintain the door in residence at any desired open or closed position. Assuming, for example, that it is desired to maintain the door at closed residence position *a*, as shown in Fig. 2, the pintle rod 31 is oriented to place the valley point 42a of the cam track in position where the cam roller 45 will reside at the valley point 42a when the door is in the selected closed position. This adjustment can be effected externally of the door, by simply loosening the nut 34 and rotating the pintle rod 31, as by means of a screw driver applied to the exposed screw driver slot 35 thereof, to the point where the valley point 42a will coincide with the selected closed position of the door.

This improved door hinge assembly may be designed to permit swinging movement of the door for a full 180° or to permit two-way swinging movement of the door by providing an inclined track section 42b extending from each side of the valley point 42a. The door may also be maintained in out-swung open position, or in-swung open position, by providing a depression notch 42d in the cam track directly adjacent the crown point 42c thereof. Thus by a selected shaping of the cam track 42, any desired door action may be achieved.

Door hinge assemblies constructed in accordance with this invention present a number of important advantages over gravity hinges as heretofore constructed and employed. This improved hinge assembly operates automatically and requires no elevating and lowering movement of the door for its proper functioning. The door can be made the full size of the door open-

ing, with the door sizes snugly conforming to the door frame sizes. Since the hinge assembly is fully concealed within the door, the operating parts are protected from dust, dirt and the weather, do not require special finishing, and can thus be made of less expensive materials. The same size and design of hinge assembly can be used for numerous different types and kinds of doors, thus making unnecessary special door hinge assemblies to accommodate various types of doors. Since effective operation of this improved hinge assembly is independent of the type and kind of mounting bracket employed, the door hinge brackets can be simplified and streamlined into numerous and various shapes, harmonizing with the architectural lines of the door and door frame. By the use of these improved hinge assemblies, projecting hinge parts which gather dust and dirt may be avoided, and greater latitude permitted in the design of doors and door frames in harmony with the most advanced architectural ideas.

While certain novel features of the invention have been disclosed herein, and are pointed out in the claims, it will be understood that various omissions, substitutions, and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. An improved door hinge assembly including, an elongated pintle rod adapted to be fixed to an exterior hinge bracket and extending into the door body, means for swingably supporting the door body from said hinge bracket, a cam member presenting a cam track contained within the door body and fixed to said pintle rod, a member within the door body swingably mounted on said pintle rod and having a portion thereof radially spaced from said pintle rod and operative to exert swinging pressure against an interior part of the door body to swing the door, a cam roller connected to said swingable member and positioned for rolling engagement with the cam track of said cam member, and means within the door body for applying a camming load on said cam roller sufficient to effect swinging movement of the door to predetermined residence position.

2. An improved door hinge assembly including in combination, an elongated pintle rod adapted to be supported by an exterior hinge bracket and extending into the door body in alignment with the axis of swinging movement of the door, a thrust bearing centered on said pintle rod and supported from said hinge bracket to provide a support for the door, a cam member having a cam track fixed to said pintle rod, a radius block swingably mounted on said pintle rod, said radius block having a portion thereof extending laterally inwardly of the door body between the wall forming faces thereof and operative to exert swinging pressure against an interior part of the door body to swing the door, a cam roller arranged to have rolling engagement with the cam track of said cam member, said cam roller being rotatably supported from a lug section projecting from said radius block and in spaced relation to said cam track, and adjustable means within the door body for exerting predetermined pressure on said radius block to thereby apply a corresponding camming load on said camming roller sufficient to automatically effect swinging movement of the door to a desired residence position.

3. An improved door hinge assembly including in combination, an elogated pintle rod adapted to be supported by an exterior hinge bracket and extending into the door body in alignment with the axis of swinging movement of the door, a thrust bearing centered on said pintle rod having a rotatable section inset within the adjacent edge of the door body and a companion bearing section adapted to be supported from the hinge bracket to provide a support for the door, a cam member having a cam track fixed to said pintle rod, a radius block swingably mounted on said pintle rod, said radius block having a portion thereof extending laterally inwardly of the door body between the wall forming faces thereof and operative to exert swinging pressure against an interior part of the door body to swing the door, a cam roller arranged to have rolling engagement with the cam track of said cam member, said cam roller being rotatably supported from a lug section projecting from said radius block and in spaced relation to said cam track, and a compression spring for exerting predetermined pressure on said radius block to thereby apply a corresponding camming load on said camming roller sufficient to automatically effect swinging movement of the door to a desired residence position.

4. An improved door hinge assembly including, an exterior hinge bracket having a wing portion designed for attachment to a door frame forming member above the floor line and an arm portion projecting from the wing portion into the door opening, an elongated pintle rod extending into the door body in alignment with the axis of swinging movement of the door, said pintle rod having means at one end thereof for adjustably securing said pintle rod to the door supporting arm of said hinge bracket, means for swingably supporting the door body from said hinge bracket, a cam member presenting a cam track contained within the door body and fixed to said pintle rod, a device within the door body swingably mounted on said pintle rod and having means radially spaced from said pintle rod operative to exert swinging pressure against an interior part of the door body to swing the door, a cam roller connected to said swingable device and positioned for rolling engagement with the cam track of said cam member, and means for exerting a predetermined pressure on said device to thereby apply a corresponding camming load on said cam roller sufficient to effect swinging movement of the door to predetermined residence position.

5. An improved door hinge assembly including, an exterior hinge bracket having a wing portion designed for attachment to a door frame forming member above the floor line and an arm portion projecting from the wing portion into the door opening, an elongated pintle rod extending into the door body in alignment with the axis of swinging movement of the door, said pintle rod having means at one end thereof for adjustably securing said pintle rod to the door supporting arm of said bracket, a thrust bearing having a section fixed to said pintle rod and a rotatable section set within the adjacent edge of the door body and rotatably supported on said fixed section, a cam member within the door body fixed to said pintle rod and having a cam track presenting an inclined track section and a valley section, a radius member slidably and swingably mounted on said pintle rod and having means extending inwardly of the door body between the wall forming faces thereof operative to exert swinging pressure against an interior part of the door body to swing the door, a cam roller having

rolling engagement with the cam track of said cam member rotatably supported from said radius member in spaced relation to said cam track, and means for exerting a predetermined pressure on said radius member to thereby apply a corresponding camming load on said cam roller sufficient to effect swinging movement of the door to residence position.

6. An improved door hinge assembly including, an exterior hinge bracket having a wing portion designed for attachment to a door frame forming member above the floor line and an arm portion projecting from the wing portion into the door opening, an elongated pintle rod extending into the door body in alignment with the axis of swinging movement of the door, said pintle rod having one end thereof extending externally of the door to present an exposed end portion, means for adjustably securing said pintle rod to the door supporting arm of said bracket, means for rotatably supporting the door body from said hinge bracket, a cam member within the door body fixed to said pintle rod and having a cam track presenting an inclined track section and a valley section, a radius member slidably and swingably mounted on said pintle rod and having means extending inwardly of the door body between the wall forming faces thereof operative to exert swinging pressure against an interior part of the door body to swing the door, a cam roller rotatably supported from said radius member and having rolling engagement with the cam track of said cam member, means for exerting a predetermined pressure on said radius member to thereby apply a corresponding camming load on said cam roller sufficient to effect swinging movement of the door to predetermined residence position, and means associated with the exposed end portion of said pintle rod whereby said pintle rod may be adjusted from the exterior of the door body to selectively orient the valley point of the cam track and accordingly selectively adjust the residence position of the mounted door.

7. An improved door hinge assembly including, an elongated pintle rod having an end portion adapted to be fixed to an exterior hinge bracket and a shank portion extending into the door body, a thrust bearing centered on said pintle rod and operative to rotatably support the door body from said hinge bracket, a cam member presenting a cam track contained within the door body and fixed to said pintle rod, a radius arm slidably and swingably mounted on the shank portion of said pintle rod and contained within the door body, said radius arm having a portion radially spaced from said pintle rod and operative to exert pressure against an interior part of the door body to swing the door, a cam roller rotatably supported by said radius arm positioned for rolling engagement with the cam track of said cam member, and means within the door body for applying a camming load on said cam roller sufficient to effect swinging movement of the door to predetermined residence position, said camming load means including a helical spring telescoped over the shank portion of the pintle rod and supported from said radius arm, and adjustable means associated with said shank portion for variably adjusting the camming load exerted by said helical spring.

8. An improved door hinge assembly including, an elongated pintle rod adapted to be fixed to an exterior hinge bracket and extending into the door body, means for swingably supporting the door body on said pintle rod, a cam member presenting a cam track contained within the door body and fixed to said pintle rod, a radius arm slidably and swingably mounted on said pintle rod and contained within the door body, said radius arm having a portion radially spaced from said pintle rod and operative to exert pressure against an interior part of the door body to swing the door, a cam roller rotatably supported by said radius arm positioned for rolling engagement with the cam track of said cam member, and means for exerting a predetermined pressure on said radius arm to thereby apply a corresponding camming load on said cam roller sufficient to effect swinging movement of the door to predetermined residence position.

9. An improved door hinge assembly including, a normally stationary pintle rod having a projecting end portion adapted to be adjustably fixed to an exterior hinge bracket and a shank portion extending into the door body, a thrust bearing centered on said pintle rod and operative to swingably support the door body from said hinge bracket, a cam member presenting a cam track contained within the door body centered on and fixed to said pintle rod, a radius member slidably and swingably mounted on said pintle rod and contained within the door body, said radius member having means radially spaced from said pintle rod and operative to exert swinging pressure against an interior part of the door body to swing the door, a cam roller rotatably supported by said radius member positioned for rolling engagement with the cam track of said cam member, means for exerting a predetermined pressure on said radius arm to thereby apply a corresponding camming load on said cam roller sufficient to effect swinging movement of the door to residence position, and means associated with the end portion of said pintle rod whereby said pintle rod may be adjusted exteriorly of the door body to selectively orient said cam track and accordingly selectively adjust the residence position of the mounted door.

10. An improved door hinge structure including, a pintle rod having an end portion adapted to be fixed to an exterior hinge bracket and a shank portion extending into the door body, a bearing unit centered on said pintle rod for swingably supporting the door body from the hinge bracket, a cam member presenting a cam track contained within said door body and fixed to said pintle rod, a reciprocable member within the door body having a portion radially spaced from said pintle rod and operative to exert pressure against an interior part of the door to swing the door, means for guiding the reciprocable movement of said member in a direction generally parallel to said pintle rod, a cam roller rotatably supported by said reciprocable member within the door body and positioned for rolling engagement with the cam track of said cam member, and means within the door body for applying a camming load on said cam roller to effect swinging movement of the door to a predetermined residence position.

11. An improved door hinge structure including, a pintle rod having an end portion adapted to be fixed to an exterior hinge bracket and a shank portion extending into the door body, a bearing unit centered on said pintle rod for swingably supporting the door body from the hinge bracket, a cam member presenting a cam track contained within the door body centered on and fixed to said pintle rod, a reciprocable

member within the door body having a portion radially spaced from said pintle rod and operative to exert pressure against an interior part of the door to swing the door, means for guiding the reciprocable movement of said member in a direction generally parallel to said pintle rod, a cam roller rotatably supported by said reciprocable member within the door body and positioned for rolling engagement with the cam track of said cam member, means within the door body for applying a camming load on said cam roller to effect swinging movement of the door to residence position, and means associated with the end portion of said pintle rod whereby said pintle rod may be adjusted exterior of the door body to selectively orient said cam member and

accordingly selectively adjust the residence position of the mounted door.

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