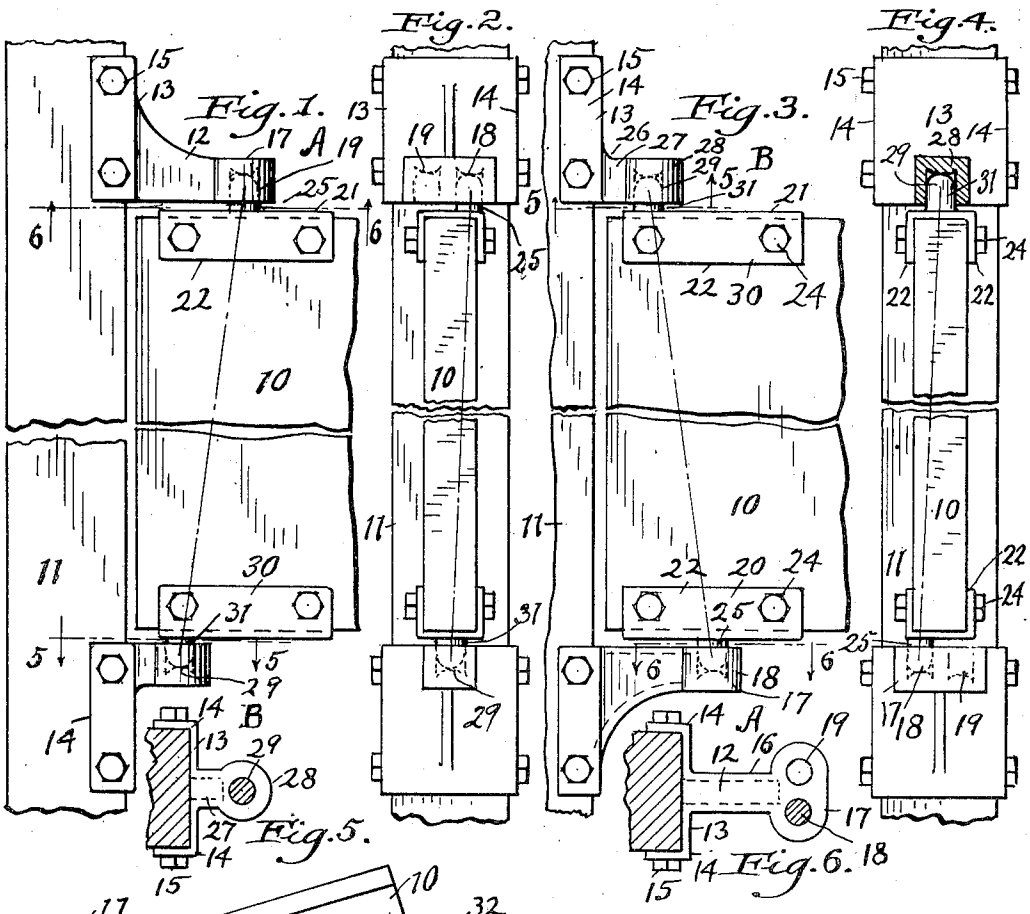
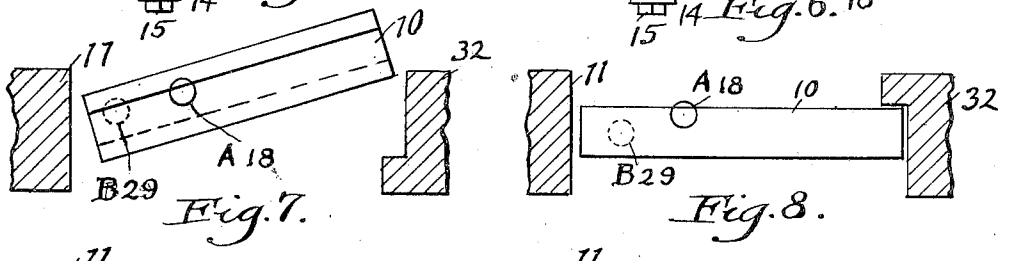
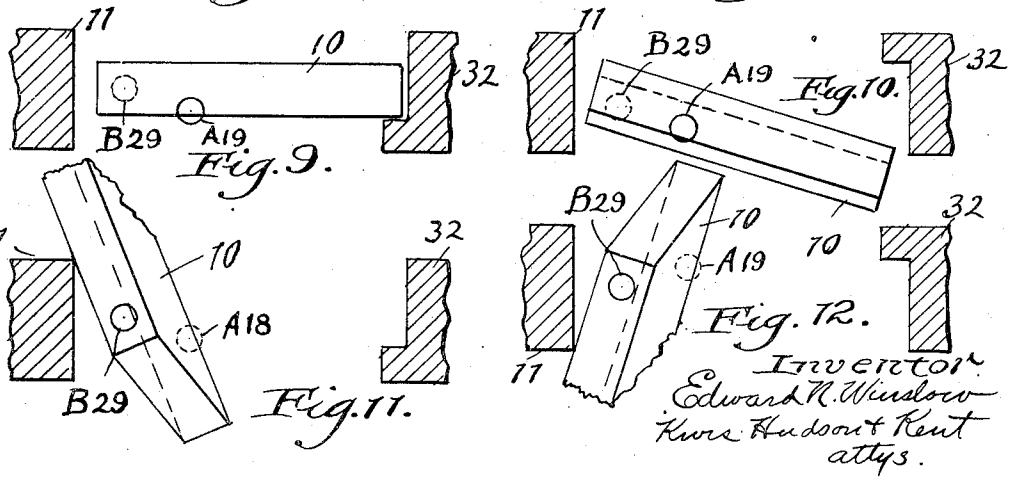
Jan. 23, 1934. E. N. WINSLOW 1,944,386

HINGE

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HINGE

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2 Claims. (Cl. 16—152)

This invention relates to hinges, and more particularly to devices of this character which are adapted to pivotally support a swinging member in such a manner that, when released, the weight of the swinging member will return the same to a desired position of rest.

While the invention is of general application for swinging members of all kinds, the preferred embodiment shown is for supporting swinging doors for toilet enclosures, which doors in their closed position lie in a substantially vertical plane. For various reasons, some of such doors are required to swing inwardly, others outwardly; some are required to come to rest closed, others partly ajar, and others wide open. To provide different hinges to suit each installation is obviously burdensome, and it is therefore an object of the invention to provide a device of this character which is adjustable so that the same hinge may be employed to pivotally support swinging members for gravity return to different desired positions of rest.

More specifically stated, it is an object of the invention to provide a pair of hinges in which one hinge has the pivot point thereof offset with respect to the pivot point of the other, and which is adjustable to alter the offset and thereby adapt the pair to support swinging members for various desired gravity return positions.

Another object is to construct the adjustable hinge of parts which may be selectively assembled in different relations to provide different offsets for the respective desired gravity return positions.

A further object of the invention is to provide a self returning hinge which will avoid the use of springs, rollers, and inclined cam surfaces, and also avoid vertical movement of the door in swinging, and gravity action except through the pivotal axis of the door.

Other objects and features of novelty will be apparent as the following description proceeds, reference being had to the accompanying drawing, in which

Figure 1 is an elevation of a swinging door pivotally mounted on a support by means of devices constructed in accordance with one embodiment of the present invention.

Fig. 2 is a side elevation of the structure shown in Fig. 1.

Fig. 3 is an elevation similar to Fig. 1 but showing the hinges reversed.

Fig. 4 is a side elevation of the structure shown in Fig. 3.

Fig. 5 is a section taken along the line 5—5 of Figs. 1 and 3.

Fig. 6 is a section taken along the line 6—6 of Figs. 1 and 3.

The remaining views are diagrammatic showings of the various positions of rest to which the swinging member may be returned by its own weight, depending upon the selection and arrangement of the hinges and parts thereof.

Fig. 7 shows an arrangement whereby the door comes to rest slightly ajar. Fig. 8 shows the arrangement for returning the door to the closed position. Fig. 9 is similar to but reversed with respect to Fig. 8, thus returning the door to closed position on the other side of the door opening. Fig. 10 illustrates a condition reversed with respect to Fig. 7, showing the door slightly ajar on the other side of the opening. Fig. 11 shows the conditions for returning the door to wide open position. Fig. 12 is reversed with respect to Fig. 11 and shows the door returned to wide open position on the other side of the door opening.

Referring more particularly to the drawing, the swinging member is illustrated as a door 10 and comprises a rectangular member of substantially any desired construction, and is pivotally supported for swinging movement with respect to a support 11, which is shown as a rectangular corner post of a toilet enclosure and preferably of sheet metal construction, as is customary with this installation. The door 10 is also preferably of sheet metal, and may be a filled panel comprising a sheet metal casing enclosing corrugated paper or other filler, or it may be a thin panel construction reenforced by rails and stiles which are mitered and welded, or otherwise joined. However, it should be understood that the material and construction of the door do not in any way enter into the present invention.

The invention contemplates a pair of devices for pivotally supporting the respective end portions of the door, which devices are shown as hinges and are indicated generally at A and B. The hinge A comprises a socket member or bracket 12 which may be secured to the corner post in any desired manner. In the form shown, this member has a vertical body portion 13, the inner face of which is adapted to engage the side of the corner post 11, and flanges 14 projecting laterally and overlying each side of the corner post. Bolts 15 pass through the flanges 14 and the corner post 11 to secure the bracket in position. A vertical web 16 projects laterally from the body portion 13 and terminates in a double boss 17,

in the face of which are formed sockets 18 and 19.

The other part of the hinge member A is formed by a pintle member secured to the corner post in any desired manner. As shown, a channel or U-shaped member 20 has substantially horizontal web 21 and side flanges 22. The channel is adapted to receive a margin of the door 10, and bolts 24 pass through the flanges 22, as well as the door, thus securing the channel to the door. The member 20 carries a pintle 25 which projects from the side of the web 21 opposite to the flanges 22. The pintle 25 is preferably integral with the member 20 and preferably solid, but the same may be of hollow construction so that the walls thereof are of substantially the same thickness as the remaining parts of the member 20.

As shown in Figs. 2 and 4, the pintle 25 is offset lateraly with respect to the member 20 and is also offset with respect to the plane of the door, and the sockets 18 and 19 are correspondingly offset. This arrangement is important, inasmuch as, by merely reversing the member 20, the pintle 25 may be arranged to cooperate with the other socket of the pair.

The hinge member B comprises a bracket 26, the flanges 14 and bolts 15 of which are identical with those described in connection with the hinge A and therefore will not be again described in detail. The bracket 26 includes a web 27 similar to but smaller than the web 12. This web carries a single boss 28 in which is formed a socket 29 which is symmetrically arranged with respect to the web and the remaining portions of the bracket.

The remaining part of the hinge B comprises a channel member 30, the web 21, flanges 22, and bolts 24 which are identical with those described in connection with the member 20 and are therefore given the same reference characters. The member 30 carries a pintle 31 whch is symmetrically arranged with respect to the flanges 22 but which is arranged nearer to the inner end of the member 30 than the pintle member 25. As to construction, the pintle 31 is identical with the pintle 25.

The double socket 18 and 19 of the hinge member A, selectively cooperating with the laterally offset pintle 25, effects one offset for the pivot point of this member. In the case of the hinge member B, a different offset is provided by the socket 29 and pintle 31 being arranged closer to the support 11 than the corresponding elements of the hinge member A. Thus the pivotal connection of the hinge member B is offset in the plane of the door with respect to the pivot point of the hinge member A, and the same is true whether the socket 18 or 19 is employed.

Still another variation of the offset is provided by bodily reversing the hinge members A and B. Thus in Fig. 1, where the hinge member A is at the top and the hinge member B is at the bottom, the pivotal axis of the swinging member is inclined toward the bottom of the support 11. In Fig. 3, these members are reversed so that the hinge member A is at the bottom and the hinge member B is at the top. This results in the pivotal axis of the door member 10 being inclined toward the top of support 11.

With the hinges described above, the same pair of hinges may be used to support doors for return solely by the weight thereof to six different positions of rest, as shown diagrammatically in Figs. 7 to 12 inclusive, in which the upper pivotal connection is indicated by full circles, and the lower by dotted circles. In Figs. 7, 8, 9, and 10, the hinge A is the upper and hinge B is the lower, like Figs. 1 and 2 in this respect. In Figs. 11 and 12, hinge B is the upper and hinge A is the lower like Figs. 3 and 4 in this respect.

With the arrangement shown in Fig. 7, the hinge member B is employed at the bottom of the door and the hinge member A is employed at the top, with the pintle 25 inserted in the socket 18. The weight of the door will bring the same to rest in a position slightly ajar.

In Fig. 8, the arrangement of the hinge members A and B is also the same except that the door jamb 32 is reversed, and it will be obvious that the weight of the door tends to hold the same in closed position.

In the arrangement shown in Fig. 9, the member 20 is reversed, so that the pintle 25 cooperates with the socket 19. The operation of this arrangement is similar to but reversed with respect to that shown in Fig. 8.

The result shown in Fig. 10 is obtained by arangement of the pintle 25 to cooperate with the socket 19. This arrangement produces the reverse of the arrangement shown in Fig. 7, with the result that the door comes to rest slightly ajar.

The pivot of hinge A is offset from the pivot of hinge B both longitudinally and transversely with respect to the closed position of the door. Hence the line through both pivots, which is the pivotal axis of the door, is inclined with respect to the support 11, and is also inclined with respect to the closed position of the door. The door tends to swing to a position of equilibrium, in which the center of gravity thereof lies in a vertical plane through the pivotal axis, or, in other words, in a vertical plane through both pivots.

This condition is shown in Figs. 7 and 10, in which the position of equilibrium is at an acute angle to the closed position. Figs. 8 and 9 are identical with Figs. 7 and 10 in this respect, but the door jamb 32 engages the door and prevents the same reaching the position of true equilibrium. When the hinges A and B are reversed, the pivotal axis is inclined in the opposite direction, so that the position of equilibrium is at an obtuse angle to the closed position of the door. In Figs. 11 and 12, the support 11 prevents the door from reaching the true position of equilibrium.

With the arrangement shown in Fig. 11, in order to cause the weight of the door to hold the same wide open, the hinge member B is at the top and the hinge member A is at the bottom, with the pintle 25 engaging the socket 19. This is the arrangement illustrated in Figs. 3 and 4.

To obtain the results shown in Fig. 12, the arrangement is similar to that shown in Figs. 3 and 4, but the pintle 25 cooperates with the socket 18 and thus brings the door to rest in a wide open position.

Inasmuch as the real pivotal axis of the door, passing through both hinges, is inclined to the vertical, the pintles 25 and 31 or the sockets 18, 19 and 29 must be designed to allow for the same, as by providing loose fits, or rounding off the ends of the pintles, or the outer edges of the sockets. However, these parts may be accurately machined to the true pivotal axis if desired, and liners of different metal may be employed to improve the bearing.

It should be noted that the specific attach-

ment to the door or post is not essential, and the same may be widely varied. Each hinge must have a bracket portion secured to the post, but the cooperating portion therefor may be merely a pin or socket built into the door, without any bracket construction.

The construction of the hinges whereby the same pair of hinges may be used to obtain several different results is quite important, inasmuch as the hinges A and B may be produced in enormous quantities, preserving the economies of large scale production, and various pairs of these hinges may be used to mount different doors for gravity return to different desired positions without requiring separate manufacture of hinge fittings therefor.

While various combinations and installations of the preferred embodiment of the invention have been illustrated and described in such detail as to enable any one skilled in the art to practice the invention, it is obvious that various changes and modifications may be resorted to without departing from the spirit of the invention. For this reason, it is to be understood that the invention is not limited to any of the details disclosed, other than as necessitated by the development of the prior art, but, instead, includes such embodiments of the broad idea as fall within the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A door hinge comprising a post member and a door member, one of said members having a pair of laterally spaced pivoting elements, the other of said members having a single laterally offset pivoting element adapted to cooperate with one of said first-named elements when the second member is in one position, and to engage the other of said first-named elements when the position of the second member is reversed.

2. A door hinge comprising a post member and a door member, one of said members having a pair of spaced pivoting elements, the other of said members having a single pivoting element adapted to be assembled in operating relation to either one of said spaced pivoting elements to the exclusion of the other, whereby the door upon which the hinge is mounted may be caused by gravity to come to rest in either one of two different positions.

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