

Sept. 3, 1963

K. M. JOHNSON ETAL
DOOR MOUNTING ASSEMBLY

3,102,307

Filed Sept. 1, 1959

3 Sheets-Sheet 1

FIG. 1

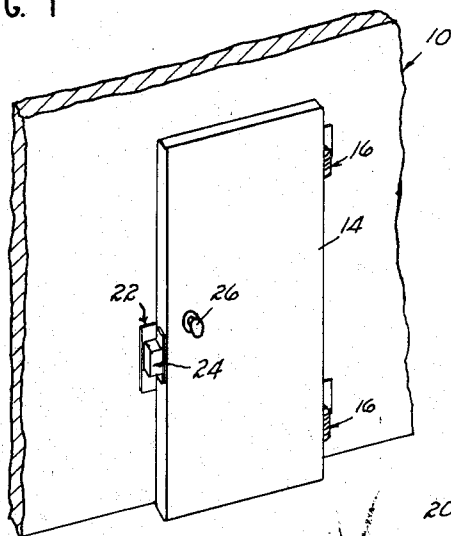


FIG. 2

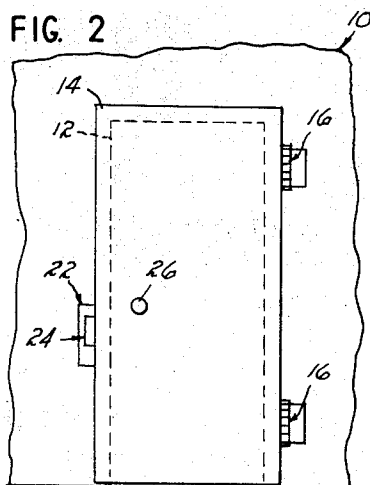


FIG. 3

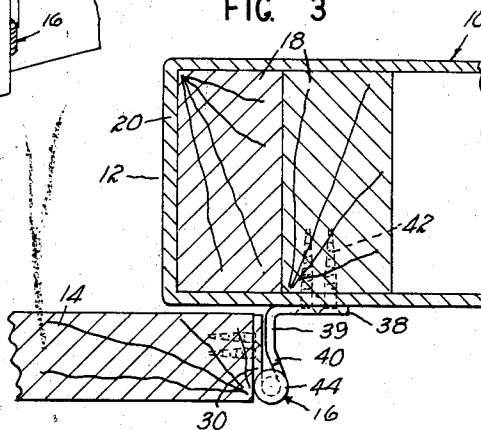
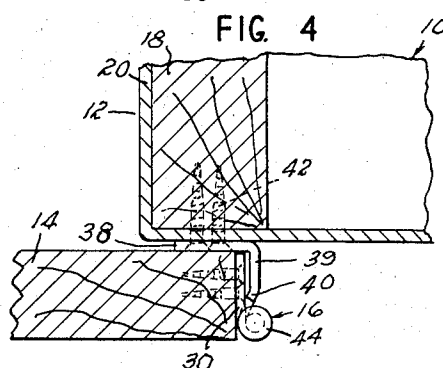


FIG. 4



INVENTORS
WALTER J. MAGFARLANE
KENNETH M. JOHNSON

BY

Lindsey and Prutzman
ATTORNEYS

Sept. 3, 1963

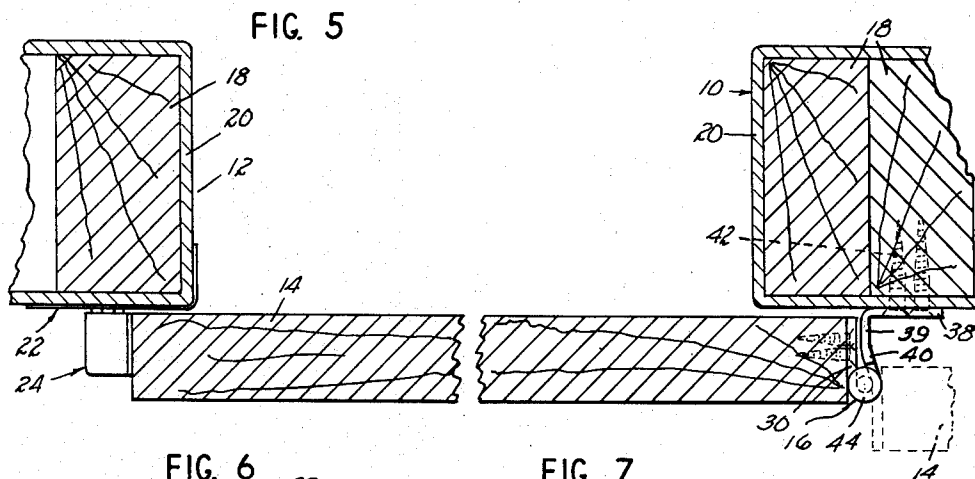
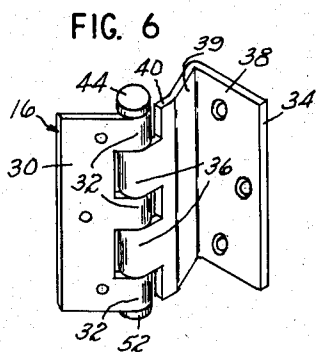
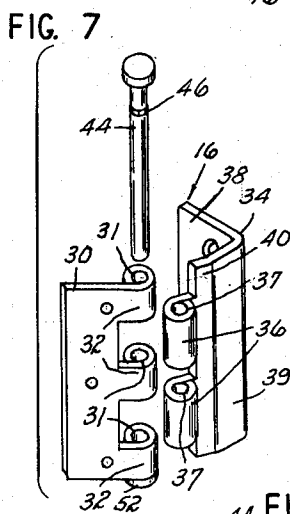
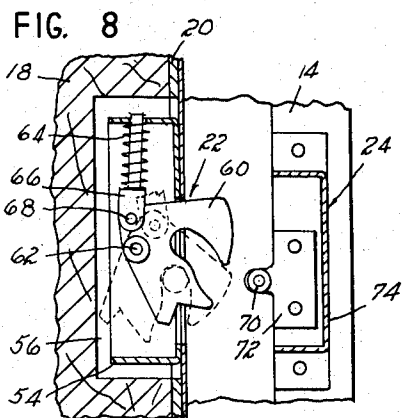
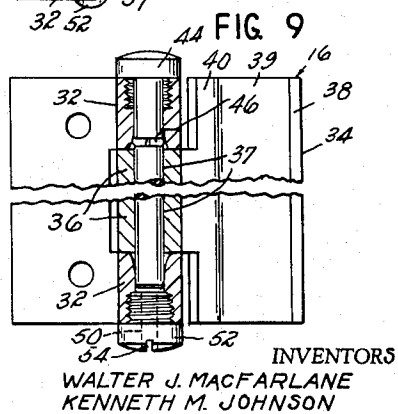
K. M. JOHNSON ETAL

3,102,307

DOOR MOUNTING ASSEMBLY

Filed Sept. 1, 1959

3 Sheets-Sheet 2



BY *Lindsey and Prutzman*
ATTORNEYS

Sept. 3, 1963

K. M. JOHNSON ET AL

3,102,307

DOOR MOUNTING ASSEMBLY

Filed Sept. 1, 1959

3 Sheets-Sheet 3

FIG. 10

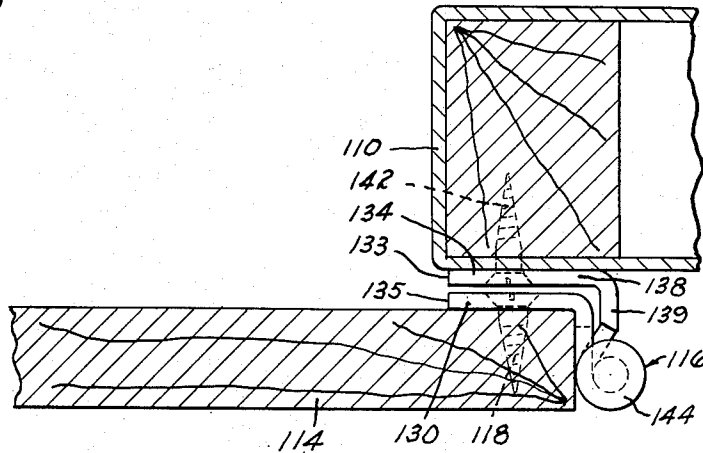
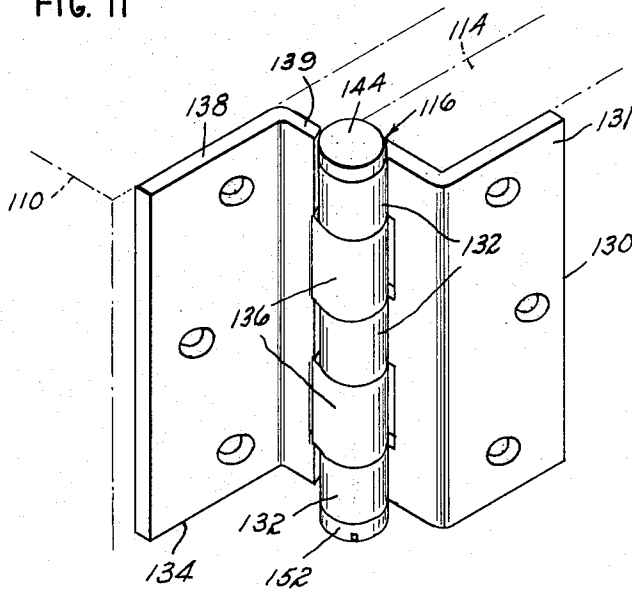


FIG. 11



INVENTORS
WALTER J. MACFARLANE
KENNETH M. JOHNSON
BY

Lindsey and Prutzman
ATTORNEYS

1

3,102,307

DOOR MOUNTING ASSEMBLY

Kenneth M. Johnson, Kensington, and Walter J. MacFarlane, New Britain, Conn., assignors to The Stanley Works, New Britain, Conn., a corporation of Connecticut

Filed Sept. 1, 1959, Ser. No. 837,476

6 Claims. (Cl. 20—16)

The present invention relates to a new and improved type of door mounting especially adapted for use in residential and other types of buildings. The invention is concerned more particularly with a novel arrangement for disposing a door relative to a door opening and to new and improved hardware for use in combination therewith. The present application is a continuation-in-part of our prior application Serial No. 796,826, filed March 3, 1959, now abandoned.

The conventional way of mounting swinging doors in homes and other types of buildings, is to first frame a door opening with a header and jambs and then trim the door so that it will fit fairly closely within the frame opening with the edges of the door enclosed by the frame. The door is usually mounted in the frame by use of conventional butt hinges whose leaves are recessed in one edge of the door and adjacent jamb. The door is usually held in closed position by a latch mechanism recessed in the opposite edge of the door and a keeper recessed in the adjacent jamb. Such conventional door mounting arrangements are relatively expensive to manufacture and install, since it entails the making of a door frame which usually is a composite of several members frequently formed of wood and including stops, moldings and other decorative elements for finishing the edge of the opening which have to be fitted to the door opening and permanently secured thereto. Also, after the door frame has been fitted and installed, it then becomes necessary to accurately dimension the door so that it will fit relatively closely within the door opening and normally this has to be done at the place of installation because of dimensional variations which usually occur during the installation of the door and door frame. After the door has been fitted to the door frame, it is then necessary to accurately mortise one edge of the door and the corresponding jamb of the door frame for installation of the hinges. To hang the door it is the usual practice to disassemble the hinges and secure the individual hinge plates in the mortised recesses of the door edge and jamb, respectively, following which the door is placed in the door opening and the knuckles of the hinge plates are interfitted to permit replacement of the hinge pins. In addition, as mentioned above, the door has to be provided with a conventional door latch wherein the latch mechanism is recessed in one edge portion of the door and a cooperating keeper and strike plate is recessed into the adjacent jamb of the door frame. All of these operations entail expensive and time consuming hand operations which greatly add to the cost of the construction and in addition there are certain other disadvantages, such as the fact that the door cannot be completely fabricated or prefinished prior to installation and in the event of subsequent warpage or shrinkage of the door or door frame members, the door may stick or fit so poorly in the door opening as to become unsightly in appearance.

The aim of the present invention is to provide a new type of door mounting which greatly reduces the cost of manufacture and assembly, both with respect to the finishing or framing of the door opening and with respect to the dimensioning of the door and the steps required to mount the door.

Included in this aim is the provision of a new door

2

mounting arrangement having many advantages from a decorative standpoint and including the advantage of using completely prefinished doors.

Another aim of the invention, is to provide a novel set of hardware for use in combination with the door and door opening which is easy to install and assemble and which is decorative in appearance.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a fragmentary perspective view of a wall and a door mounted thereon in accordance with the invention;

FIG. 2 is a fragmentary front view of the door and wall assembly with the door opening shown in dotted lines;

FIG. 3 is an enlarged fragmentary cross-sectional view of one door edge and side of the door opening with the hinge mounted in fully exposed position;

FIG. 4 is a view similar to that of FIG. 3 with the hinge reversed to partially concealed position;

FIG. 5 is an enlarged fragmentary cross-sectional view of the door and door opening;

FIG. 6 is a perspective view of a hinge with the hinge assembled in the position shown in FIGS. 3 and 5;

FIG. 7 is an exploded perspective view showing one of the hinge plates reversed for assembly in the position shown in FIG. 4 of the drawing;

FIG. 8 is a fragmentary cross-sectional view of the latch and keeper mechanism;

FIG. 9 is a fragmentary side view of the hinge with the knuckles in cross section;

FIG. 10 is a view similar to FIG. 4 showing a modified form of the hinge for use with doors of reduced thickness, the hinge being mounted in the partially concealed position; and

FIG. 11 is a perspective view of the hinge shown in FIG. 10 with the door and wall in phantom, the door being in fully open position.

Referring to the drawings and particularly to FIGS. 1, 2 and 5 thereof, there is shown a building wall 10 provided with a rectangular opening or passageway 12. Unlike conventional door installations, the door 14 does not fit within the opening 12 but instead is disposed parallel to the outer surface of the wall 10 externally of the door opening 12 and is dimensioned so that it extends beyond the top and side edges of the door opening and so that it overlies both the opening 12 and the portion of the wall surrounding the opening. The door is swingingly mounted on the exterior surface of the wall 10 by means of hinges 16, which will be described in more detail hereinafter. Since the door does not have to be fitted within the door opening 12, it can be completely prefabricated and finished by the fabricator of the door and no further treatment is required at the time of installation.

When utilizing the door mounting of the present invention, it is unnecessary to frame the door opening 12 for, as best shown in FIGS. 3, 4 and 5, the surface of the sides of the door opening can be merely a continuation of the finish surface of the wall. Normally, the wall will contain one or more studs 18 which are disposed at opposite sides of the door opening and this may be covered with plaster or wall board, etc. denoted at 20 which is the same as the surface coating of the wall. In any event, the surface of the wall surrounding the opening 12 is preferably left planar and flush with the remaining surface

of the wall as shown and ornamental moldings and the like are omitted.

As previously stated, the door 14 is mounted on the external surface of the wall 10 by means of the hinges 16 so that when the door is in closed position it covers the door opening 12 and also the portions of the wall surrounding the opening 12. The door may be retained in the closed position by means of a releasable latch 22 which is recessed into the wall at the side of the opening opposite from the hinges for cooperation with a keeper assembly 24 mounted on the edge of the door. A decorative handle 26 may be provided on the outer face of the door for convenience in opening and closing the door.

The hinges 16 are of new and improved form especially designed for use in mounting the door in the manner described. The details of the hinge are best shown in FIGS. 6, 7 and 9 of the drawings. Each hinge includes one leaf 30 which is a flat leaf having a plurality of symmetrically spaced rolled knuckles 32 along one edge. The leaf 30 is adapted to be mounted on the edge of the door on the surface thereof without being recessed as indicated in FIGS. 3, 4 and 5. The rolled knuckles 32 are offset from the plane of the leaf 30 and have aligned bores 31 whose axes are similarly offset from the longitudinal centerline of the leaf 30. Thus the knuckles 32 will not interfere with the flush mounting of the leaf 30 on the surface of the edge of the door even though the knuckles 32 do not project outwardly beyond the corner or outer face of the door. The second leaf of the hinge 16 comprises a generally L-shaped plate 34 which also is provided with symmetrically arranged rolled knuckles 36 intended to interfit with the rolled knuckles 32 of the first leaf 30. The inner leg 38 of the hinge plate 34 is adapted to be mounted on the surface of the wall 10 and the outer leg 39 extends outwardly at right angles thereto and parallel to the first hinge leaf 30 when the door is in closed position. The centerline of the rolled knuckles 36 and the aligned bores 37 thereof is substantially in alignment with the longitudinal centerline of the outer leg 39, this being accomplished by a slight bend in the leg 39 as indicated at 40. As a result of the central disposition of the knuckles 36, it is possible to assemble the hinge with the L-shaped leaf 34 extending outwardly away from the door opening and exposed adjacent the edge of the door as shown in FIGS. 3 and 5, or to assemble the hinge leaf so that the inner leg 38 extends in the opposite direction toward the door opening so as to be concealed by the door as shown in FIG. 4 of the drawings. Since the operation of the hinge is the same in either case, the assembly of the hinge with the leaf 34 extending in either a left-hand or a right-hand direction will be determined in most instances by the appearance which is desired by the user. Another consideration is that with the hinge assembled as shown in FIGS. 3 and 5, it is somewhat easier to attach the hinge to the wall, since the hinge can be attached with the door in closed position. Another factor which must be considered is the availability of studding for receiving the wood screws 42 (shown in dotted lines) for as indicated by comparison of FIGS. 3 and 4 of the drawings, additional or wider studding is required when the hinge is assembled with the leg 38 extending outwardly of the door opening.

In order to assemble the hinge in either a left-hand or right-hand direction, all that is necessary is to pull the pintle 44 which is seated in the bores of the knuckles 32 and 36 and then reverse the hinge leaf 34 following which the pintle 44 is re-inserted. The pintle 44 preferably is provided with a split retaining ring 46 which engages in the tapered or convexly curved lower portion of the bore of the uppermost knuckles of the hinge leaf 30 as disclosed in the Morse Patent No. 2,154,860 which prevents the pintle from rising during normal usage of the door. The pintle can readily be disengaged from the knuckles by exerting a force on the inner end thereof

by means of a nail or pointed tool inserted through the opening 50 in the decorative tip 52, which is threadably secured in the bore of the bottom knuckle of the hinge leaf 30.

In the event that the hinge 16 is to be secured to the opposite edge of the door 14 so as to cause the door to swing in the opposite direction, the leaf 30 is inverted and in that case it is preferred to reverse the position of the decorative tip 52 so that it will still be in the lowermost knuckle of the hinge. As will be noted in the cross-sectional view of the knuckles shown in FIG. 9 of the drawings, the uppermost knuckle of the leaf 30 is threaded in the same manner as the bottom knuckle so that it can also receive the decorative tip 52. The decorative tip 52 is provided with a slot 54 so that it can be conveniently rotated by use of a screw driver or other turning tool when it is desired to remove the tip 52 from one end knuckle and replace it in the other. The bore of the lowermost knuckle is also tapered or convexly curved at its inner end for cooperation with the retaining ring 46 of the pin 44. The pin 44 may be inserted from either end and is preferably positioned in the bores of the knuckles so that its head is at the top of the assembled hinge. Thus it will be apparent that by reversing the tip 52 and inserting the pin 44 from the opposite end, the assembled hinge when placed on the opposite edge of the door will still have the decorative tip at the bottom and the pin will be treated from the top. When the hinge is applied to the left-hand edge of the door, the leaf 34 may be assembled with its leg 38 extending away from the opening 12 and in exposed position or extending toward the opening 12 and concealed in just the same way as explained in connection with the mounting on the opposite edge of the door.

The modified hinge 116 shown in FIGS. 10 and 11 of the drawings, is similar to the hinge 16 just described and includes an L-shaped hinge plate 134 which is like the plate 34 except that the leg 139 is of shorter length so as to reduce the dimension or distance between the knuckles 136 and the inner leg 138. The removable pintle 144 and the decorative tip 152 correspond to the pintle 44 and tip 52 previously described. The second hinge plate 130 differs from the plate 30 by being provided with a right-angled extension 131 thus making it L-shaped in cross section. The plate 130 is dimensioned so that when the hinge is assembled for mounting in the partially concealed position, the plates 130 and 134 will be disposed in nesting relationship and with the ends 133, 135 in alignment.

As shown in FIGS. 10 and 11, the modified hinge 116 is intended for use with doors of relatively thin cross section or relatively small thickness. In this embodiment, the door leaf 130 extends around the inner corner of the door 114 and is secured to the door by screws 118 fastened to the inner surface of the door instead of to the end surface. As shown in FIG. 10, the leaf 134 is attached to the wall 110 by screws 142. It will be understood that as in the case of the hinge 16 previously described the pintle 144 and tip 152 may be removed to permit the leaf 134 to be reversed for attachment to the wall in an exposed position in the manner illustrated in FIGS. 3 and 5 of the drawings.

As illustrated in FIG. 11 of the drawings, the disposition of the knuckles 136 and 132 in an offset relationship to the legs 131 and 138 permits the door to be opened a full 180° without striking the surface of the wall 110.

The latch 22 comprises a frame 54 which is recessed in an opening 56 provided in the wall 10 for this purpose and also includes an escutcheon plate or outer housing of L-shaped cross section which covers the opening 56 and extends about the corner of the door wall opening as best shown in FIG. 5 of the drawings. The latch 22 includes a generally U-shaped bolt 60 which is pivoted on the frame at 62 and which is biased to open or closed position by a spring 64 mounted on the plunger 66. The

5

plunger 66 is pivotally attached at one end to the bolt at a pivot 68 offset from the pivot 62 and is slidably mounted at its other end in the frame 54. In FIG. 8 of the drawings, the latch is shown in open or releasing position in solid lines and is shown in closed or latching position in dotted lines. As will be apparent, the plunger 66 and bolt 60 in cooperation with spring 64 form a toggle which acts to bias the bolt to either the open or closed position. The keeper comprises a roller 70 rotatably supported on the mounting plate 72 secured to the adjacent edge of the door 14 and is partially concealed by a protective housing 74 which is also mounted on the edge of the door. When the door is moved to closed position, the roller 70 strikes the lower leg of the U-bolt and pivots it until the toggle passes over center whereupon the spring urges the bolt to the latching position engaging the keeper as shown in dotted lines. When the door is opened, the opening force on the door will pivot the bolt in the opposite direction until the toggle again moves over center thus releasing the keeper as shown in solid lines. With this type of latching mechanism no operating handle or knob is required.

When the door is moved to open position it entirely clears the door opening 12 and can be readily pivoted a full 180 degrees as indicated in dotted lines in FIG. 5 of the drawings. When the door is moved to closed position there preferably is a slight clearance between the inner face of the door and the wall surface surrounding the door opening. If a tighter closure is desired, such as on an outside door, suitable weather-stripping may be provided to form a seal between the door and wall surface.

It thus will be apparent that there has been provided a novel and improved door mounting assembly which affords substantial savings in cost of fabrication and installation of the door and door opening. In addition, the novel mounting assembly is attractive in appearance and provides many decorative advantages, such as the possibility of using doors of varying shapes and configuration inasmuch as the door merely overlies the wall opening and is not fitted therein.

Variations and modifications which will be apparent to ones skilled in the art are intended to be included within the scope of the invention.

We claim:

1. In combination, a wall having a planar exterior finish surface and a through opening therein wherein the areas defining the opening including the side walls of the opening and the wall portions surrounding the opening are formed with an exterior finish surface which is a continuation of the wall finish surface, a door of smaller dimensions than the wall but of greater width and height throughout than the wall opening, means mounting the door on the wall for swinging movement toward and away from a closed position wherein the door extends parallel to the wall entirely outside the door opening and overlies the wall opening and a portion of the wall surrounding the wall opening, said means comprising a plurality of hinges, each including a generally L-shaped first leaf having one leg fixedly mounted on and parallel to the exterior surface of the wall adjacent one side of the opening and having its other leg extending outwardly generally perpendicular thereto and parallel to the side edge of the door when the door is in closed position, said other leg being provided with vertically spaced knuckles at its outer end and a second leaf having vertically spaced knuckles at its outer end interfitting with the knuckles at the outer end of said other leg and mounted on the door, said second leaf having a flat portion immediately adjacent the knuckles extending along the surface of one edge of the door to position the knuckles immediately adjacent the outer corner of said one edge of the door, said flat portion being of smaller width than and extending in side-by-side overlying relationship to said other leg of the first leaf when the door is in closed position, a removable pintle disposed in said knuckles,

6

a releasable latch recessed in the wall adjacent the side of the opening opposite from the hinges, and a keeper mounted on the surface of the edge of the door for engagement with the latch.

2. In combination, a wall having a through opening therein and wherein the wall surfaces surrounding the opening are planar and flush with the remaining surface of the wall, a door of smaller dimensions than the wall but of larger dimensions throughout than the wall opening, means mounting the door on the wall for swinging movement toward and away from a closed position wherein the door extends parallel to the wall and overlies the wall opening and a portion of the wall surrounding the wall opening, said means comprising a plurality of hinges each including a generally L-shaped first leaf having one leg fixedly mounted on the wall surface adjacent one side of the opening and a second leg extending outwardly generally perpendicularly to the wall and parallel to the side edge of the door when the door is in closed position having vertically spaced knuckles at its outer end, and a second leaf having vertically spaced knuckles interfitting with the knuckles at the outer end of said second leg and mounted on the door, said second leaf having a flat portion immediately adjacent the knuckles extending along the surface of one edge of the door to position the knuckles immediately adjacent the outer corner of said one edge of the door, said flat portion being of smaller width than and extending in side-by-side overlying relationship to said second leg of the first leaf when the door is in closed position, a removable pintle disposed in said knuckles, and latching means for releasably retaining the door in closed position comprising a first member mounted on the wall adjacent the side of the opening opposite from the hinges and a second member for cooperation therewith mounted on the outer edge of the door.

3. In combination with a wall having a through opening wherein the wall surfaces surrounding the opening are planar and flush with the remaining surface of the wall and a door of smaller dimensions than the wall but of larger dimensions throughout than the wall opening, means mounting the door on the wall for swinging movement of approximately 180 degrees toward and away from a closed position wherein the door extends parallel to the wall and overlies the wall opening and portions of the wall surrounding the opening, said means comprising a plurality of hinges, each including a generally L-shaped first leaf having one leg fixedly mounted on and parallel to the wall surface adjacent one side of the opening and a second leg extending outwardly generally perpendicular to the wall and parallel to the side edge of the door when the door is in closed position, said second leg being provided with vertically spaced knuckles at its outer end, a second leaf mounted on the door, said second leaf having a flat portion extending along the surface of one edge of the door and having vertically spaced knuckles at its outer end disposed immediately adjacent the outer corner of said one edge of the door, the knuckles of the second leaf interfitting with the knuckles of the first leaf, said flat portion of the second leaf having approximately the same length as the second leg of the first leaf and overlying said second leg when the door is in closed position, said knuckles having aligned bores, and a pintle disposed in said bores and pivotally connecting the leaves.

4. For use in mounting a door on the exterior surface of a wall having a through opening of smaller width than the door and wherein the door is to be mounted for swinging movement to and from a closed position parallel to the wall and overlying the wall opening and portions of the wall at opposite sides of the opening, a hinge comprising a generally L-shaped first leaf having one leg adapted to be fixedly mounted on the wall surface adjacent one side of the wall opening and generally parallel to the wall surface and a second leg in the form of a sin-

gle rectangular plate extending generally at right angles to the first leg, symmetrically positioned and spaced knuckles on the outer end of the second leg having axially aligned bores in substantial alignment with the longitudinal centerline of said second leg, a second leaf for attachment to the door and having a rectangular flat portion of approximately the same length but of smaller width than the second leg engageable with the edge of the door and having symmetrically spaced knuckles along one edge interfitting with the knuckles of the first leaf and having axially aligned bores offset from the longitudinal centerline of said flat portion of the second leaf, said second leg of the first leaf and said flat portion of the second leaf being movable to a parallel overlying position in the closed position of the door, and a removable pintle disposed in the aligned bores.

5. For use in mounting a door on the exterior surface of a wall having a through opening of smaller width than the door and wherein the door is to be mounted at a selected one side of the wall opening for swinging movement to and from a closed position parallel to the wall and overlying the wall opening and portions of the wall at opposite sides of the opening, a universal hinge comprising a generally L-shaped first leaf adapted to be fixedly mounted on the wall surface adjacent one side of the wall opening with one leg extending generally at right angles to the wall and with the other leg parallel to the wall surface, said leaf being mountable on the wall selectively with said other leg extending from said one leg toward or away from the wall opening, symmetrically spaced knuckles on the outer end of said one leg having aligned bores in substantial alignment with the longitudinal centerline of the said one leg, an L-shaped second leaf for attachment to either edge of the door having one leg engageable with an edge of the door and provided at its outer end with symmetrically spaced knuckles interfitting the knuckles of the first leaf and having aligned bores offset from the longitudinal centerline of said one leg of the second leaf, said offset being sufficient to permit the said one leg of the first leaf to extend parallel in overlying relationship to said one leg of the second leaf, a removable pintle insertable into the aligned bores from either end, a decorative tip, and means for selectively

attaching the tip in the bore of either of the outermost knuckles.

6. For use in mounting a door on the exterior surface of a wall having a through opening, a universal hinge comprising a generally L-shaped first leaf adapted to be fixedly mounted on the wall surface adjacent one side of the wall opening with one leg extending generally at right angles to the wall and with the other leg parallel to the wall surface, said leaf being mountable on the wall selectively with said other leg extending from said one leg toward or away from the wall opening, symmetrically spaced knuckles on the outer end of said one leg having aligned bores in substantial alignment with the longitudinal centerline of the said one leg, an L-shaped second leaf attachment to the door having a pair of legs adapted to extend about the corner of the door with one of said pair of legs adapted to engage the edge of the door and having symmetrically spaced knuckles interfitting the knuckles of the first leaf and having aligned bores offset from the longitudinal centerline of said one of the legs of the second leaf, said offset being sufficient to permit the said one leg of the first leaf to extend parallel in overlying relationship to said one leg of the second leaf, a removable pintle insertable into the aligned bores from either end, a decorative tip, and means for selectively attaching the tip in the bore of either of the outermost knuckles.

References Cited in the file of this patent

UNITED STATES PATENTS

2,016,519	Schmidt	Oct. 8, 1935
2,137,529	Ferris	Nov. 22, 1938
2,290,035	Conwell	July 14, 1942
2,655,685	Lewis	Oct. 20, 1953
2,772,106	Semelka	Nov. 27, 1956
2,808,610	Minor	Oct. 8, 1957
2,867,840	Peterson	Jan. 13, 1959

OTHER REFERENCES

American Builder Magazine, January 1959, page 26.
Popular Science Magazine, vol. 173, No. 3, September 1958, pp. 232, 234, 236 and 238.