

July 22, 1952

D. J. SEAMAN

2,603,825

DOOR PIVOT

Filed Aug. 7, 1948

4 Sheets-Sheet 1

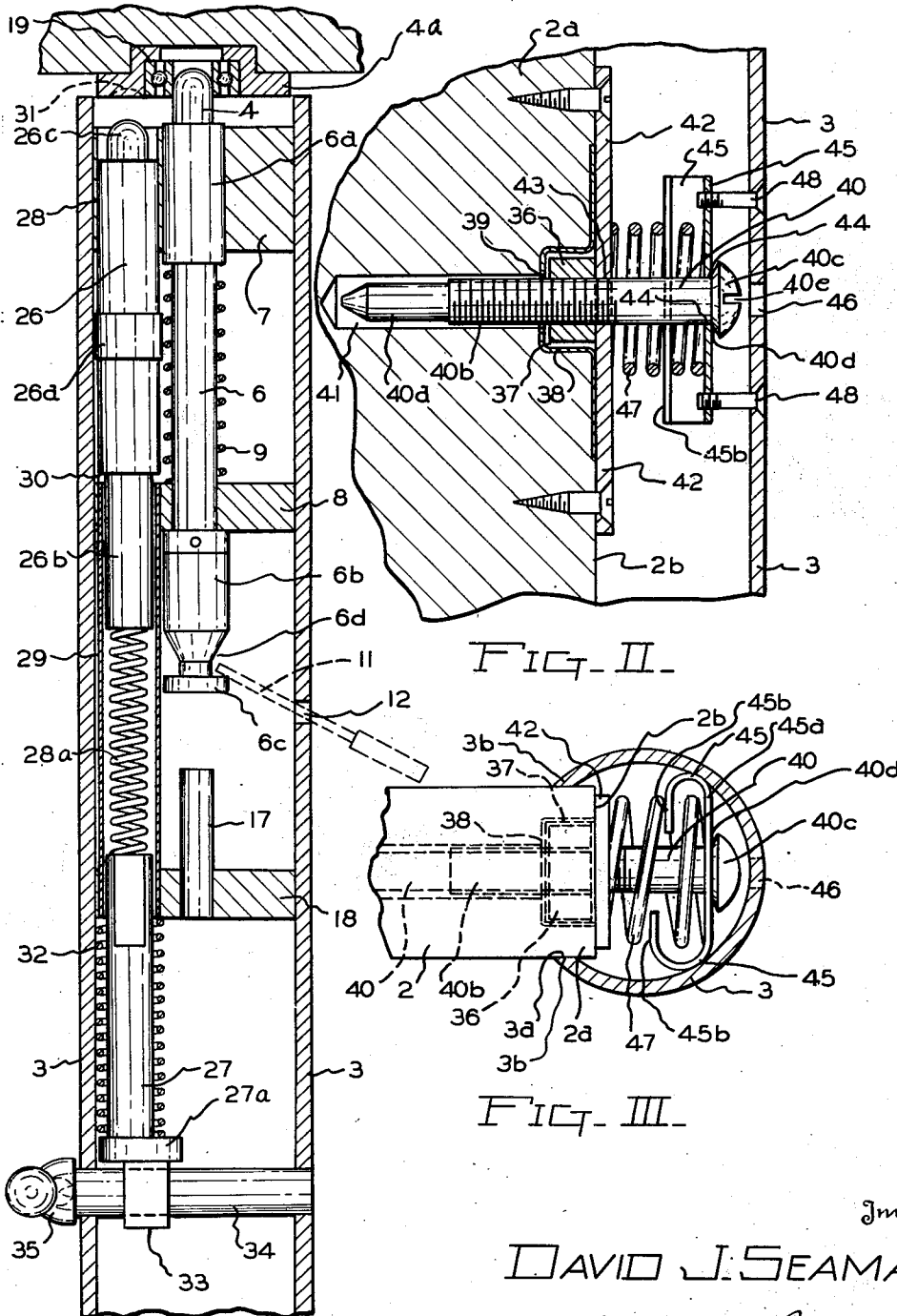


FIG. I.

FIG. II.

FIG. III.

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4 Sheets-Sheet 2

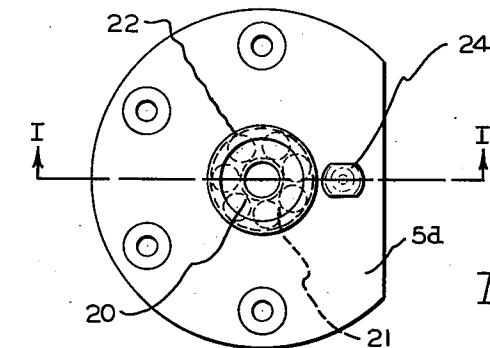


FIG. VI.

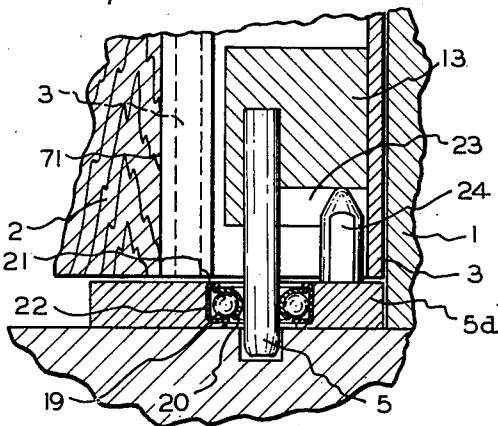


FIG. V.

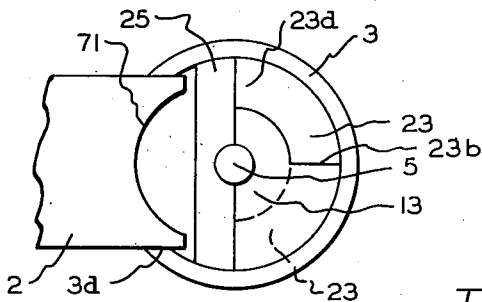


FIG. VIII.

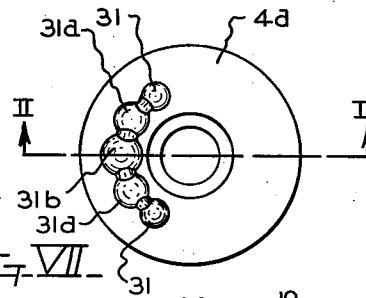


FIG. VII.

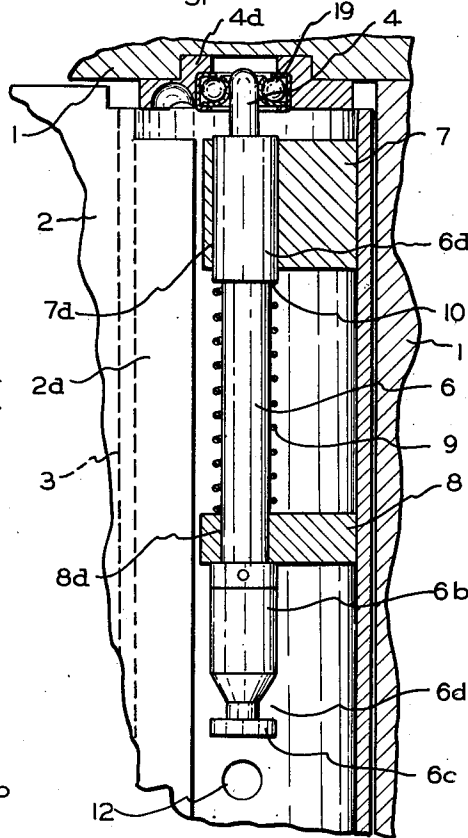


FIG. IV.

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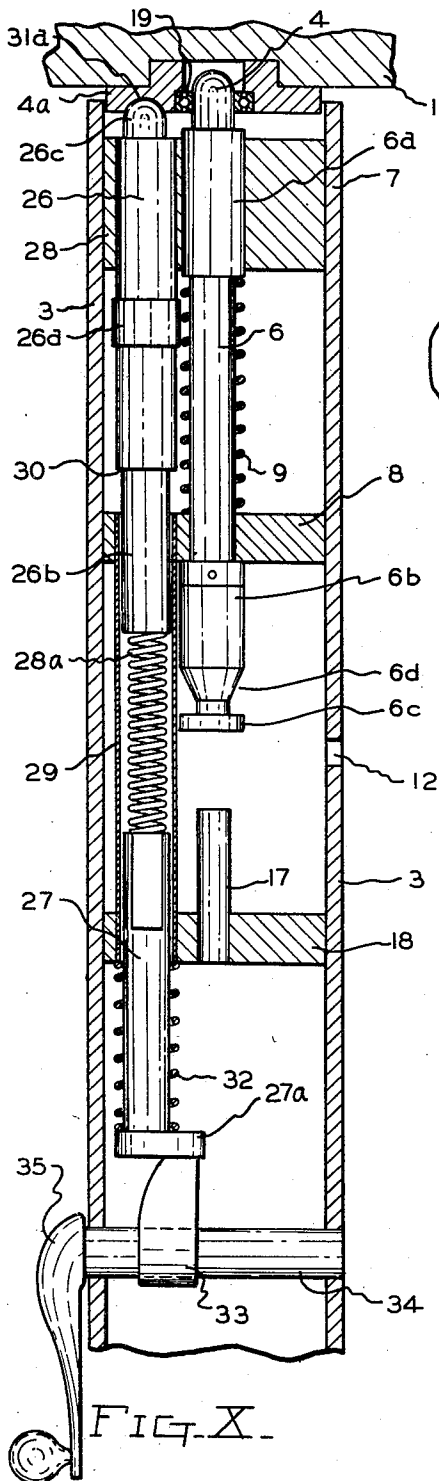


FIG. X.

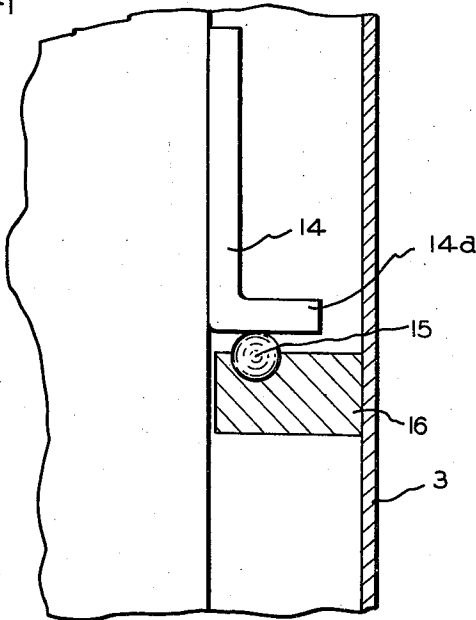


FIG. IX.

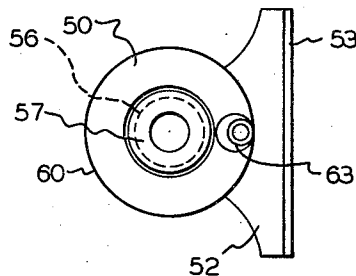


FIG. XIV.

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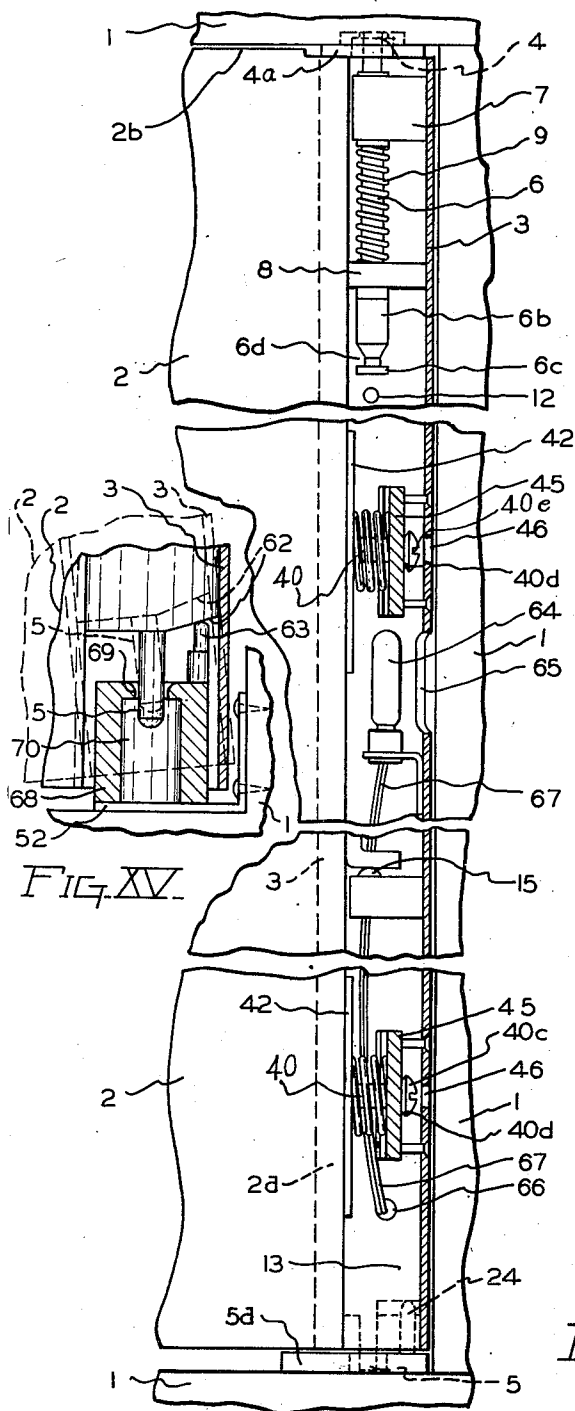
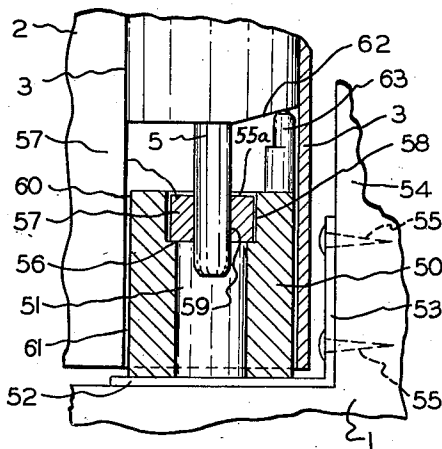
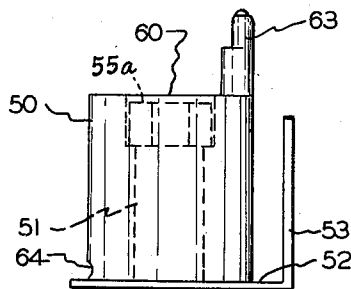
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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DOOR PIVOT

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Application August 7, 1948, Serial No. 43,071

4 Claims. (Cl. 16-151)

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This invention relates to doors and particularly to the manner of mounting doors and the like for their required pivotal or swinging movement with respect to their surrounding frame structure or the opening which they are required to close. The invention is also applicable to pivotally mountable window constructions and to pivoted lids or flaps for furniture and where the expression "door" is used herein this is intended to include such alternative constructions, in such instances where the application of the features of the invention thereto is indicated as useful or desirable.

It is the object of the invention to provide a door structure and mounting means therefor which possesses the following advantageous features:

1. The possibility of mounting the door in position in a rapid and simple manner without the necessity of affixing screwed hinges, as is usual,

2. The possibility of adjusting the door, while in situ, to compensate for variations in shape or size thereof, or of the surrounding frame structure (or both), on account of expansion or contraction changes, or for other reasons,

3. The possibility of the door partaking automatically of a closing movement when released from an opened position, and

4. The possibility of the door being held automatically in an ajar position following opening or closing movements of the door.

The above functional possibilities are achieved in a practical and efficient manner, and with the reduction of maintenance requirements to a minimum, by the construction of a door and mounting means therefor as will now be described with reference to the accompanying drawings in which:

Fig. I is a fragmentary longitudinal section through the tubular post provided in accordance with the invention to receive a door and to support the same for its pivotal motion with respect to the door frame structure or opening, the section being of the upper portion of the tubular post and being taken on a plane transverse to the plane of the door, and showing the position of the parts with the door closed and the holding ajar mechanism inoperative,

Fig. II is an enlarged fragmentary section through an intermediate portion of the tubular door post and showing the means employed to secure the door upon the post while permitting the ready adjustment of the door with respect to the latter,

Fig. III is a plan view of Fig. II,

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Fig. IV is a view similar to Fig. I, but with the section taken at right angles thereto, that is in a plane parallel with the plane of the door,

Fig. V is a fragmentary longitudinal section showing the lower end of the tubular door post with its lower pivot and the gravity cam action,

Fig. VI is a plan view of the lower socket plate employed for the pivotal mounting of the lower end of the tubular door post,

Fig. VII is an underneath plan view of the upper socket plate employed for pivotally mounting the upper end of the tubular door post and showing the cam depressions for giving the automatic ajar positions,

Fig. VIII is an underneath plan view of the bottom end of the tubular door post showing the gravity action cam track employed to give the automatic closing condition.

Fig. IX is a fragmentary vertical section of another intermediate portion of the tubular door post, showing the anti-friction means employed to mount the door with respect to the post,

Fig. X is a longitudinal section similar to Fig. I but showing the door post mechanism adjusted to provide for the automatic obtaining of a holding ajar condition of the door following the opening and closing movements thereof, the mechanism being shown in the position corresponding to a partly opened condition of the door with the latter held ajar in such position,

Fig. XI is a generally schematic and part longitudinal sectional view of a door construction and pivotal mounting arrangement in accordance with the invention, with intermediate portions of the door and associated parts broken away for convenience of illustration,

Fig. XII is a fragmentary vertical section of a modified construction and arrangement of the bottom pivot bearing socket for the door mounting structure,

Fig. XIII is a side elevational view of this modified bearing socket,

Fig. XIV is a plan view of Fig. XIII, and

Fig. XV is a similar view to Fig. XII but of yet another and probably preferred construction of bottom pivot socket unit, which dispenses with the use of a floating bearing, this figure showing in dotted lines the positioning of the door for mounting its pivot pin for engagement in the socket unit.

Referring to the drawings and first to Fig. XI, there is shown therein a portion of a door frame structure 1 in which a door 2 is pivotally mounted through the medium of a tubular, and normally metal, post element 3. The latter, which is of

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cylindrical form and preferably extends along the entire length (or depth) of the longitudinal edge portion 2a of the door, has a longitudinal slot 3a (Fig. III) through which the edge portion 2a of the door extends and is embraced by the divided longitudinal tube edges 3b.

Pivotal mounting of door
(Figs. I, IV, V, VI, X, XI)

The post 3 carries upper and lower pivot pins 4 and 5 respectively engageable in socket plates 4a and 5a to provide for pivotal mounting of the door, so that the latter is able to partake of its required opening and closing swinging movements.

The upper pivot pin 4 is constituted by the upper end portion of a plunger rod 6 centrally mounted within the upper portion of the tube 3 so as to be co-axial with the latter, and mounted for sliding movement with respect to transverse bearing blocks 7 and 8 secured within the tube 3 in longitudinally spaced relationship and having axially aligned bores 7a and 8a respectively for the passage of the rod. The latter has an enlarged portion 6a engageable with the one bore 7a, and a coil spring 9 is provided about the portion of the rod which extends between the two said blocks, one end of this spring bearing against a collar 10 formed between the rod portions 6a and 6 and the other end of the spring bearing against the block 8. The spring 9 serves to urge the rod as a whole towards the upper end of the tube 3 so that the pivot end 4 normally projects beyond this tube end to form the required pivot for the upper end of the door. Such outward biasing of the rod, however, is limited by the enlarged lower end portion 6b of the rod contacting the underneath surface of the block 8. The rod portion 6b terminates in a collar 6c forming between it, and the rod portion 6b, an annular recess 6d. The purpose of this recess is to enable an implement, such as a screwdriver head 11, as indicated in dotted lines in Fig. I, to be inserted through an opening 12 in the tube 3 and engaged in the recess, whereby to permit pressure to be applied to the rod so as to force the same downwards against the pressure of the spring and thereby retract the end 4 of the rod from its pivot forming position with respect to the socket plate 4a.

The lower pivot pin 5 is conveniently constituted by a spigot projecting downwardly from a block 13 fixedly secured within the lower end of the tube 3.

The weight of the door structure is transmitted by the tube 3 to a fixed cam follower pin 24, to be described later.

Downward movement of the rod 6 is limited by the stop pin 17 (Figs. I and X) upstanding from the block 18 secured within the tube 3.

Both the upper pivot pin 4 and the lower pivot pin 5 are engaged within bearings, indicated generally at 19, and carried upon the respective socket plates. These bearings are formed to provide a self-aligning characteristic. Each bearing is formed by an inner ring 20 of arcuate cross section (Figs. IV and V) which ring forms the inner race for a series of balls 21, the outer race for which is constituted by an outer ring 22 of the channel cross section and disposed so that its side flanges overlie the peripheral edges of the inner race 20. The assembly of the inner and outer race rings is such as forms an enclosed annular space within which the balls 21 are permitted to partake of a limited degree of free translational motion, the inner ring 20 being

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free to partake also of this translational motion and this with respect to the outer race ring, which latter is secured within a central opening in its corresponding socket plate. These bearings 19, therefore, are in the form of floating bearings and serve the useful purpose of facilitating the mounting of the door for its pivotal motion, since the arrangement permits the lower door pivot to be engaged in the bottom socket plate with the door being held in an inclined position, followed by an inward movement of the door structure at the top to position the retracted upper pivot pin 4 opposite the upper socket plate.

To mount the door for its pivotal motion the bottom pivot pin 5 is first engaged within the central opening in the inner race ring 20 of the floating bearing in the bottom socket plate 5a, and this while the door is held in an open position with respect to the door frame structure. While so held, with the bottom pivot pin 5 engaged in the lower bearing, the door is capable of being pushed inwardly at its upper end to engage the upper pivot pin 4 within the inner race ring 20 of the floating bearing in the upper socket plate 4a, the upper pivot pin 4 being held in its operative position with respect to the bearing in the upper socket plate by the action of the spring 9.

To release the door for removal from the door frame, it is merely necessary to depress the rod 6 in the manner above described, whereupon the door post 3 is free to be moved away from the socket plate 4 to bring the upper end of the post clear of the door frame structure and thereby to permit the door to be lifted bodily in order to free the bottom pivot pin 5 from its socket plate 5a.

The tubular door post 3 and its end mounting plates 4a and 5a also incorporate means by which the door is given either an automatic closing action or is capable of being automatically held ajar at a predetermined angular position with respect to the door opening.

Automatic closing action—Figs. V, VIII and XI

The automatic closing action results from the formation of the underneath surface of the block 13 with an arcuate cam track 23 and by the provision of the lower socket plate 5a with an upstanding cam follower pin 24 so disposed that the said cam track bears upon the upper end of this pin, the latter in fact serving with the anti-friction arrangement above described to support the full weight of the door and associated structure.

The cam track has its highest end at 23a and falls away gradually to its lower end 23b. That is to say, the end 23a of the cam track is nearer to the lower end of the tubular post 3 than the end 23b, and the cam track surface is correspondingly inclined between these two ends, with the end 23a merging into a flat horizontal surface 25 forming part of the underneath surface of the block 13.

The construction and arrangement is such that with the door post mounted in position to permit of the door swinging movement and with the door closed, the low end 23b of the annular cam track bears upon the cam follower pin 24. In this position of the parts the upper end of the tubular door post 3 is situated, as shown in Figs. I, IV and XI, with the upper edge of the door post substantially in the plane of, or even above, the underneath surface of the socket 4a, with respect to which latter the upper end por-

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tion of the door post is capable of partaking of telescopic movement. Upon the door being swung open, the cam track 23 is moved upon the cam follower pin 24 until, in the fully open condition of the door, the said flat surface 25 is brought to rest in engagement with the pin. In this condition, that is in the fully open condition of the door, the latter is, in fact, held automatically open but is capable of swinging automatically into its closed position after the door has been pushed to move the surface 25 away from engagement with the cam follower pin and to bring the high end 23a of the annular cam track opposite the pin. When this happens the door will automatically swing to its closed position due to the resulting gravity action of the inclined annular cam track 23 sliding upon the pin 24.

If desired, or necessary, the cam track end 23b may be formed with a shallow depression with which the pin 24 engages automatically to hold the door closed, thereby providing a self-latching condition.

As above stated, in the closed position of the door, the upper end of the tubular post 3 is positioned for telescopic movement with respect to the upper socket plate 4a and will in fact be telescoped with respect to the socket plate as the door is swung open and the door is lifted due to the annular cam track being traversed with respect to the pin 24 from its low end 23b, corresponding to the closed door condition, to its high end 23a and beyond the latter onto the flat surface 25, the latter corresponding to the fully open condition of the door. This freedom of telescopic movement of the upper end of the tubular door post 3 with respect to the upper socket plate 4a enables the door to be constructed with a minimum of clearance along its upper edge with respect to the upper transverse door frame member and in fact permits substantially the entire upper edge 2b of the door to be brought almost flush with the corresponding edge of the upper transverse member of the door frame structure, since the arrangement of the cam track 23 with respect to the cam follower pin 24 will be such that upward lifting of the door will only commence after the major portion of the upper transverse edge 2b of the door has been swung clear of the upper transverse rail of the door frame structure. In practice, it is only necessary to chamfer or recess the inner portion of the upper transverse edge of the door immediately adjacent the tubular post 3 to permit the required lifting action to take place. Provision may be made for radial adjustment of the pin 24 to be possible whereby the pin is adjustable transversely with respect to the cam track 23.

Automatic holding ajar condition (Figs. I, IV, VII, IX)

The automatic holding ajar condition results from the formation of the upper socket plate 4a with a series of circumferentially spaced depressions and by the provision of a vertically reciprocable plunger rod 26 mounted within the upper end of the tubular post 3, the plunger rod 26 being co-axial with another rod 27 and with a co-axial coil spring 28a interposed as a flexible link between the two rods. The rod 26 has a sliding fit through a bore 28 in the block 7 and has a collar portion 26a which limits the upward sliding movement of the rod. At its lower end the rod 26 is formed with a smaller diame-

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ter shank portion 26b slidably mounted within the open upper end of a tube 29 fixed between the blocks 8 and 10. The shoulder 30 formed between the shank 26b and the lower end of the rod 26 serves to limit the downward movement of the rod 26, as will be understood.

At its upper end the rod 26 is formed with a rounded head portion 26c which is located opposite the said series of depressions in the underneath surface of the upper socket plate 4a. These depressions are disposed upon an arc, as seen in Fig. VII, and correspond in number and angular position to the number of ajar positions required and the required angle at which such ajar positions should occur. In the particular example illustrated three such depressions are provided and indicated at 31, 31a and 31b. These depressions are of varying depths to conform with the lifting movement of the tubular post 3, as will be hereinafter mentioned. The lower rod 27 extends by its upper end through the open lower end of the fixed tube 29 and the rod 27 at its lower end is formed with an abutment 27a, which abutment, by the action of a coil spring 32, surrounding the rod 27, is maintained in friction-tight engagement with a cam 33 fixed upon a rotary transverse spindle 34 mounted within the tubular post 3 and carrying on the outside of the latter a handle 35 by which the spindle is capable of being oscillated to cause either the high or the low part of the cam to be brought to bear against the abutment 27a. The coil spring 32 bears at its upper end against the block 18 and at its lower end against the abutment 27a. This spring serves constantly to urge the abutment 27a into close friction-tight engagement with the cam 33.

In Fig. I the cam 33 is shown with its lower part in contact with the abutment 27a. In this condition the spring 32 is extended and the rod 27, coil spring 28a and rod 26 take up a correspondingly lowered position, in which the upper rod end 26c is spaced clear of the underneath surface of the upper socket plate 4a. In this condition of these parts, therefore, the rod end 26c has no camming action with respect to the recesses 31, 31a and 31b and the door, therefore, is free to be opened and closed without the obtaining of the ajar condition referred to but with the obtaining of the automatic closing condition, resulting from the engagement of the follower pin 24 with the arcuate inclined cam track 23 as above described.

In Fig. X the cam 33 is shown adjusted into its alternative position in which the high part of the cam is in contact with the abutment 27a. In this condition the spring 32 is compressed and the rod 26 is lifted with the spring 28a and rod 27 to cause the upper rod end 26c to be held in firm friction-tight engagement with the underneath surface of the upper socket plate 4a. With these parts thus adjusted, opening and closing movements of the door will cause the end 26c of the rod 26 to cam over the underneath surface of the upper socket plate 4a, against the action of the coil spring 28a, with the result that this rod end, by the action of the coil spring 28a, will snap into the recesses 31, 31a and 31b as and when these are reached and this automatically with the angular movements of the door, and hence of the tubular door post 3. The snapping of the tube end 26c into one or the other of the said depressions will automatically arrest the door in the angular position corresponding to such depression and will thereby provide the required automatic ajar condition until the rod end 26c is

cammed out of engagement with the corresponding depression by deliberate further angular movement of the door.

As above mentioned, the tubular door post 3 is lifted when the door is opened and the purpose of providing the depressions 31, 31a and 31b of varied depths is to compensate for this lifting and lowering movement of the tubular door post and thereby to maintain constant the effective length of the combined rods 26 and 27 and the intermediate spring 28a, when these are maintained in their lifted condition with the rod end 26c in one or the other of the depressions 31, 31a and 31b. The elimination of this holding ajar feature from the door mounting structure permits the latter to be mounted for its swinging motion to take place in either direction, since in such event the handle 35 and associated mechanism can be eliminated. In other words the door can be mounted for double action i. e. it can swing both inwards and outwards.

Door affixing and adjustment means (Figs. II, III and XI)

The means for affixing the door panel 2 upon the tubular door post 3 and for providing for the adjustment of the door to compensate for changes brought about by expansion or contraction of the door itself or of the door frame structure is shown in Figs. II, III and XI and involves essentially the provision of nuts mounted for limited floating movement with respect to the edge portion 2a of the door and of screw members co-operable with said nuts and carried upon the tubular door post for free swinging movement with respect thereto.

In the particular construction illustrated a pair of such nuts and associated screw members are shown and provided in longitudinally spaced relationship along their respective door and post parts and normally only two such nuts and screw members would be required. The construction and arrangement of each such nut and screw assembly is the same and accordingly only one need be described in detail.

The nut 36 is mounted within a rectangular socket 37 formed in the longitudinal edge 2b of the door 2 and lined by a metal liner socket 38 the inwardly set base of which has a central opening 39 affording a clear passageway for the inner plain end portion 40a and the adjoining intermediate and screw-threaded portion 40b of a screw member 40, the head 40c of which has a bevelled underneath annular surface 40d. The screw portions 40a and 40b are capable of being projected freely into a bore 41 formed in the door from the edge 2b thereof and the socket 37, at this edge, is closed by a cover plate 42 except for an opening 43 in this plate, with which opening the plain outer portion of the screw 40 has a sliding fit as is shown in Fig. II.

The screw 40 is retained upon the interior of the tubular door post 3 by its engagement, at its head end, with an enlarged opening 44 in the base wall 45a of a double U-plate 45 the shorter limbs 45b of the U's of which terminate in spaced relationship to the inserted screw 40, as clearly shown in Fig. III.

Access to the head of the screw 40 is obtainable through an aligned opening 46 in the tube 3, through which the operating end of a screw-driver is capable of being passed for engagement with the slot 40e in the screw head 40c. A coil spring 47 is mounted about the screw portion 40d with one end of the spring bearing against

the plate 42 and the opposite spring end bearing against the inside of the base wall 45a of the double U-plate 45.

The socket 37 affords an all round clearance for the nut 36, which accordingly has limited floating movement within the socket but is capable of being drawn tightly against the cover plate 42 when the screw 40 is tightened, as shown in Fig. II. Prior to such tightening, however, the nut 36 is permitted to partake of such floating movement, while the screw 40 is also free to swivel by its bevelled part 40d about the base of the plate 45, the latter being fixedly secured within the tube by the screws 48. Tightening of the nut takes place with compression of the spring 47. Accordingly, with the door assembled upon the door post with the nuts 36 tightened adjustment of the door panel relatively to the post 3, either transversely inwards or outwards and either in its upper portion or its lower portion, or both, is immediately and readily possible simply by the insertion of a screwdriver through one or both of the openings 46 and appropriate actuation of the corresponding screws.

Undue strain on the screws 40 is prevented by the existence of the angle plate 14 and the anti-friction ball 15, the former being secured to the door edge, as shown, with its transverse arm 14a supported upon the anti-friction member 15, the latter being provided upon a block 16 secured to the door tube 3.

Alternative and preferred pivotal mountings of lower end of door (Figs. XII, XIII, XIV and XV)

These alternative mounting sockets are preferred as they possess the advantages that the entrance to the socket is located substantially above floor level and that the socket is capable of being secured to the door frame stile. Thus ingress of soapsuds and extraneous matter or dirt normally encountered at floor level, as in washing or cleaning operations, and the clogging of the socket, is avoided while, the securing of the socket to the door stile obviates the necessity of cutting or penetrating the floor covering or carpet.

The modified socket as illustrated in Figs. XII, XIII and XIV consists of an elongated socket member 50 having a vertical bore 51 closed at the bottom by a bottom plate 52 which rests upon the floor and forms one arm of a right angle piece, the other arm 53 of which is spaced from the socket member and extends vertically for the securing of the socket unit as a whole to the door frame stile 54, as by the securing screws 55, which can be countersunk into position.

The socket bore 51 is of enlarged diameter compared with the diameter of the bottom pivot pin 5 of the door tube 3 and at its upper end this bore 51 opens into a larger diameter bore portion 55a, forming a narrow circumferential ledge 56 upon which a bearing washer 57 is supported. This washer has a clearance fit within the bore portion 55a by its external diameter being less than the diameter of the bore portion 55a, whereby to provide the clearance, indicated at 58 and to permit the washer to partake freely of limited bodily movement transversely of its bore portion 55a.

The central washer aperture 59 approximates the diameter of the pivot pin 5, whereas the outer socket surface 60 is shaped to conform with the internal shape of the lower tube portion 61, whereby the latter can telescope freely over the

socket, with an all round clearance, as shown in Fig. XII, with the pivot pin 5 engaged in the washer aperture 59 and the arcuate cam surface 62 engaged with the cam follower pin 63, all as, and for the purpose, above described.

The washer 57, therefore, functions as a floating bearing to support the lower pivot pin 5 for its required pivotal motion but as this washer is located above floor level the ingress of dirt and other matter, which would tend to clog the entrance to the socket, is avoided. At the same time one or more drainage holes 64 can be provided at the bottom of the socket 50, in case water should gain access to its interior.

The cam follower pin 63 is secured to the socket to project vertically therefrom and is preferably so secured in position upon the socket as to be adjustable in a radial direction, whereby to permit the upper end of the follower to be adjusted with respect to the width of the cam track 62.

The modified bottom pivot socket unit illustrated in Fig. XV, in which the same parts as appear in the previous figures have been given the same reference numerals, has an upstanding stub post 68 containing an end vertical bore 69 open to the top of the stub post for the reception of the bottom door post pivot pin 5 and communicating with a co-axial enlarged counter-bore 70. The construction and arrangement is such that a door, with the tubular post 3 applied thereto, can be held at an angle, as indicated in dotted lines in Fig. XV to engage the pivot pin 5 in the opening 69 and in which position the top of the door is held clear of the top pivot socket. While so held the bottom end of the tubular door post can be telescoped over the stub post 68, it being noted that the corresponding door edge portion 71 (see Fig. VIII) is hollowed-out to permit this to be effected with the door angularly adjusted into position (the counter-bore 70 assisting) until the top corner of the door has been brought into position for the engagement of the top pivot pin 4 in its socket, when the tubular door post 3 extends vertically with the stub post 68 enclosed in its bottom end portion.

By so proportioning the parts (the length of the stub post 68 being controlling) it is possible to leave the door hung upon the post 68 in the angular door mounting position as shown in dotted lines in Fig. XV until the top corner of the door is pushed inwards to engage the top pivot pin.

Double action

To adapt the door mounting means for double action, i. e. to permit the door to swing inwards or outwards, it is merely necessary to duplicate the arcuate cam track 23, as shown in dotted lines in Fig. VIII, and to provide the additional recesses 31 and 31a, as shown in dotted lines in Fig. VII, as will be understood. It will, however, be necessary to remove the handle 35 and to resort to other means to actuate the plunger rod 26 which will not impede the required double swinging door motion.

Electric lamp in door post (Fig. XI)

The tubular formation of the door mounting structure 3 renders it advantageously possible to install an electric lamp 64 within the tube and to so connect the lamp that it is automatically illuminated when the door is opened. This is rendered possible by the tube being fitted with a suitable supporting structure for holding the

lamp within the tube, and by the latter having a side window or opening 65 (which may be constituted by a transparency) through which the illumination is effective and by the tube being provided with an opening 66 through which the electric conductor 67 can pass.

Having thus described the various features of my invention and without limitation to the precise details of construction and arrangement shown in the drawings (it being understood that these may be variously modified to suit particular requirements and practical considerations) what I claim as novel and wish to claim is as follows:

1. A pivot socket unit for use to pivotally mount the lower end of a door structure having a vertically extending bottom pivot pin, comprising a socket member having an elongated vertical bore, a bearing member adapted to be supported in the upper portion of said bore for limited free transverse movement therein, said bearing member being formed to receive said pivot pin, and a bracket structure connected with said socket member and comprising a bottom plate adapted to be supported upon the bottom of a door frame and a vertical arm adapted for the securing of the socket unit to the door frame stile.

2. Means for pivotally mounting a door on a door frame, said means comprising an elongated tubular post member adapted to be secured along one longitudinal edge of the door, pivot pins on said tubular post member, upper and lower socket members adapted to be secured to the door frame at the top and bottom of the door frame, respectively, said lower socket being elongated compared with said upper socket, said pivot pins comprising an upper pivot pin and a lower pivot pin, said pins extending axially at opposite ends of said post member, spring means resiliently mounting said upper pivot pin upon said post member, said upper pivot pin being projectable beyond the upper end of the tubular post member by the action of said spring means into engagement with said upper socket or being retractable within the post member and from said socket against the action of the spring means, said bottom elongated socket being adapted to telescope into the lower end of said tubular post member with the said lower pivot pin engaged in said lower socket.

3. Pivot means as claimed in claim 2, said bottom socket including an enlarged upper bore portion, and said bottom pivot pin having a floating fit in said bore portion.

4. Pivot means as claimed in claim 2, said tubular post member housing axially spaced block members, said upper pivot pin being mounted upon said block members for axial movement, said spring means consisting of a coil spring encircling a portion of said pivot pin which extends between said block members, the ends of said coil spring bearing against said block means and said pivot pin having a bottom extension, said tubular post member having a side opening adjacent said bottom extension, whereby access can be had through said opening to said extension to retract the said pivot pin within the tubular post member against the action of said coil spring.

DAVID JOSEPH SEAMAN.

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Name	Date
Seaman -----	Dec. 19, 1939
Mussa -----	June 4, 1940
Bingham -----	Oct. 1, 1940
Rosenberg -----	July 15, 1941
Seaman -----	July 6, 1943
McGiff -----	Nov. 18, 1947

FOREIGN PATENTS

Country	Date
Great Britain -----	June 12, 1891