My invention relates to an ajar door holder. It is an object of the invention to provide an improved form of ajar door holder, which may be simply operated to hold a door ajar to any extent desired.

It is another object to provide an ajar door holder which is simple in construction, positive in action, and which may be readily manipulated for holding a door in ajar position and equally readily manipulated to disengage the holder so as to permit the door to be opened wide and, in general, the object is to provide an improved form of ajar door holder.

Briefly stated, in a preferred form of the invention I employ a swinging arm and a clamping means, which parts are to be attached to a door and door frame. The clamping means and swinging arm may be disengaged from each other so as to permit a full opening of the door. When the clamping means and arm are moved into cooperative relation (and they can be moved into such relationship only when the door is closed), then the door may be moved to ajar position, and when the door has been moved to ajar position the arm and clamping means may not be disengaged from each other. The clamping means is so constructed and arranged relatively to the arm that the arm may be clamped by the clamping means at any desired point along the length of the arm so that the door may be held in ajar position to just the desired extent. The arm and clamping means cannot be disengaged from each other from the outside of the door for the reason that such disengagement is possible only when the door is closed.

In the drawings which show, for illustrative purposes only, a preferred form of the invention:

Fig. 1 is a fragmentary view of a conventional door frame and door with one form of my improved holder attached thereto;

Fig. 2 is an enlarged sectional view taken substantially in the plane of the line 2—2 of Fig. 1 and showing the relative positions of parts when the door is closed and the clamping means of the holder disengaged from the swinging arm;

Fig. 3 is a view similar to Fig. 2, but showing the parts in coacting and operative position more or less in the positions illustrated in Fig. 1;

Fig. 4 is a sectional view taken substantially in the plane of the line 4—4 of Fig. 2;

Fig. 5 is a vertical sectional view of the arm means taken substantially in the plane of the line 5—5 of Fig. 1 and illustrating the arm in disengaged normal position;

Fig. 6 is a horizontal sectional view, taken substantially in the plane of the line 6—6 of Fig. 5;

Fig. 7 is an isometric detail view of a spring in the bracket housing; and

Fig. 8 is a similar view of a backing plate for the spring of Fig. 7.

In the drawings I have illustrated my improved ajar door holder applied to a conventional door and door frame. In the particular form illustrated, a swinging arm means, designated generally 7, is attached to the door frame while the clamping means designated generally 8 is attached to the door.

The arm means may include a housing 9 (Figs. 1, 5 and 9), mortised into the door frame and held thereon as by means of screws illustrated in Fig. 1. The housing 9 may have a U-shaped sheet metal cover 10 secured thereto as by means of screws 11—11. An arm bracket 12 has its inner end position within the bracket housing and is pivotally held therein for movement about a vertical axis by means of a pivot rivet 13 secured to the housing. The rear of the bracket 12 may be flat as indicated at 14, and a backing plate 15, which has a nice sliding fit inside the housing and cover 10, abuts the flat end of the bracket. Resilient means such as the plate spring 16 may be positioned between the bottom of the cover 10 and the backing plate 15. In the form shown, the backing plate has a projection 17 to fit an aperture 18 in the spring so as to hold the parts in proper relative position. Thus the spring acting on the backing plate, and the latter abutting the flat end 14 of the bracket, will always tend to resiliently cam the bracket to its normal central position as is best seen in Fig. 6. However, the bracket 12 may swing about the pivot 13 and in so doing one end or the other of the flat surface 14 will cam the spring down, but as soon as the bracket is free to move it will be returned by the spring to the normal position shown.

The swinging arm 19 is pivotally carried by the projecting end of the bracket, and in the form shown the end of the bracket is bifurcated and the arm 19 fits within the end of the bracket and is pivotally held therein as by means of the pivot rivet 20, as will be understood. Thus, the arm 19 may swing up about the horizontal axis of pivot 20 and the arm, with the bracket 12, may swing to some extent about the vertical axis of the pivot 13, this movement being desirable since the arm must swing up and down from its normal position of Fig. 5 to the position of Fig. 1, and as the door is opened the arm and its bracket must swing or rock to a slight extent about the vertical pivot 13.

The arm itself has a longitudinally extending slot 21 therein which is preferably of uniform width throughout except that at the top the slot is provided with an enlargement 22 to permit engagement with the clamping means, as will be described. The arm at the slotted part may be of webbed construction having a relatively thin
slotted web 23 and right angularly extending flanges 24; in other words, each part of the arm adjacent the slot is of substantially T-section, thus providing great transverse strength coupled with lightness.

The clamping means 8 (in this case attached to the door) is so constructed that the clamping member may project into engagement with the swinging arm when the door is in closed position, and when the door is opened the clamping member and arm will be held against disengagement.

The clamping means is arranged for clamping the arm at any desired position along the length thereof so as to hold the door in desired ajar position. In the specific form illustrated, the clamping means includes a bolt case 25 to be attached to the door as by means of screws 26. The bolt case has a bore 27 therein for receiving a slidding bolt 28. The bolt is held against rotation and its sliding motion is frictionally resisted.

In the form illustrated the bolt has a flat 29 milled therein, and the bolt case carries a sliding key plug 30 having a flat face 31 to fit the flat on the bolt and the key plug 30 and urged, as by means of a spring 32, into frictional engagement with the bolt. Means such as a screw plug 33 holds the spring 32 in the bore which carries the key plug 30. Thus, the bolt is held against rotation and at the same time the plug exerts a resilient frictional force on the bolt so as to resist its sliding movement.

Such resistance, however, is only heavy enough to prevent accidental or too free sliding of the bolt in the bolt casing. The bolt has clamping means for engagement with the arm, and in the form illustrated the bolt is needled as indicated at 34, leaving a head 35 thereon. The head 35 is of a size to freely pass through the enlargement 22 of the swinging arm, and the neck portion or shank 34 is of a size to freely pass the main portion 21 of the slot in the arm. The head 35 will prevent disengagement of the bolt from the arm when the shank is in the main portion 21 of the slot. The forward end of the bolt is slotted as indicated at 36 so as to provide an expansible and contractible spring shank. When the shank is expanded it will grip the opposite edges of the slot 21, and when the expanding force is relieved, the resilience of the metal of the bolt will contract it to normal size for free sliding in the slot.

The bolt shank is expanded in the form shown by means of a spindle 37 having a conical end 38 to fit a conical seat in the forward end of the bolt. The bore of the bolt and the spindle have coacting quick pitch threads 39 so that when the spindle is rotated half a turn or so the conical end 38 will expand the shank 34 sufficiently for gripping the sides of the slot. The spindle is provided with a suitable handle 40 which may have a socketed base 41 to receive the knurled end 42 of the spindle. Means such as a screw 43 passing through the handle and into the spindle will serve to draw the handle up onto the knurled end of the spindle and securely hold the handle in any rotatively adjusted position on the spindle. The handle 40 may be provided with a projection 44 so as to hold the handle away from the door so that it may be easily engaged by the fingers.

The operation is as follows:

With the parts in the positions illustrated in Fig. 2, that is, the positions where the arm and clamping means are disengaged from each other (so that the door could be opened wide), the handle 40 is urged toward the left, and the spindle along with the sliding bolt will be moved to the left against the friction of the plug 30 until the head 35 passes through the enlargement 22 of the swinging arm. Thereafter, the door is opened and the shank 34 then passes into the main part 21 of the slot. When the door is in the desired ajar position, the handle 40 is rotated so as to project the spindle nose 33 into the conical bore of the bolt and expand the shank into tight frictional engagement with the sides of the slot 21 as indicated in Fig. 3. The handle 40 will then be more or less in the position shown in Fig. 1, the position of course depending upon the general design, including the lead of the threads 39.

Thus, the door will be securely held in any desired ajar position. To loosen the clamping means, the handle 40 is simply moved back so as to withdraw the conical nose 33 of the spindle and permit the resilient shank 34 to spring back to its normal position.

It will be observed that the arm and clamping means can only be engaged with each other when the door is in fully closed position and when they are once engaged with each other they cannot be disengaged from each other when the door is in any position other than the closed position.

When the arm and clamping bolt are disengaged from each other, that is, when they are in the position shown in Fig. 2, the door may be freely opened and it is possible for the bolt 28 to be projected either accidentally or by toying with the handle 40. With the bolt projected, it would ordinarily be impossible to close the door for the reason that the bolt would strike against the swinging arm. I have therefore provided an inclined projection or strike 45 on the arm, which strike would be engaged by the projected head 35 on the bolt so that in closing the door the bolt would be cammed back to its normal position as shown in Fig. 2. If desired, the arm may be provided with a hook end 46, which may simply be dropped over the end of a shank 34 when the bolt is projected, so as to hold the door in maximum ajar position. If desired a rubber or other buffer button 48 may be carried by the housing 9 in position to numb the arm 19 when it is free of the clamping means.

While the invention has been described in considerable detail and a preferred form illustrated, it is to be understood that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

I claim:

1. In an ajar door holder for attachment to a door frame member and a door member, a swinging arm to be attached to one of said members, clamping means to be attached to the other of said members, said swinging arm having a longitudinally extending member therein, said clamping means including an expansible clamping member to ride in said slot, and means for expanding said expansible member for causing it to frictionally grip within said slot, for the purpose described.

2. In an ajar door holder to be secured to a door frame member and a door member, a swinging arm to be attached to one of said members, clamping means to be attached to the other of said members, said clamping means including a sliding bolt member movable from an inoperative position to a position to engage said swinging arm, said bolt at the point engageable with said arm being laterally expansible and contractible whereby it may be expanded and contracted for releasing and gripping said arm, and means co-
acting with said sliding bolt member for causing the laterally expansible and contractible portion thereof to frictionally grip said swinging arm at any desired position along the length thereof.

3. In an ajar door holder to be attached to a door frame member and a door member, a swinging arm to be attached to one of said members, clamping means to be attached to the other of said members, said swinging arm having a longitudinally extending slot therein with an enlargement at one part of said slot, said clamping means including a sliding bolt having a head thereon and a reduced shank in rear of said head, said head being of a size to pass through said enlargement of said slot when said sliding bolt member is projected into operative position, said head being of a size to prevent withdrawal of said sliding bolt member from said slot at a point removed from the enlargement thereof, said bolt having a longitudinal slot adjacent the head thereon to render said bolt laterally expansible at the reduced shank portion thereof, and means for expanding said sliding bolt at the reduced shank portion in said slot to cause said sliding bolt member to frictionally grip within said slot for holding the door member ajar to any desired extent.

4. In an ajar door holder for attachment to a door frame member and a door member, a swinging arm to be attached to one of said members, clamping means to be attached to the other of said members, said clamping means including a bolt case, a bolt slidable therein, and projecting therefrom, means for frictionally resisting sliding of said bolt member, an expansible end on said bolt member, camming means within said expansible end, means for moving said camming means to expand said expansible end, said sliding bolt member being operable with said swinging arm for clamping the latter in any desired position relatively to said clamping means.

5. In an ajar door holder to be attached to a door frame member and a door member, a swinging arm to be attached to one of said members, clamping means to be attached to the other of said members, said clamping means including a bolt case, a bolt slidable therein and projecting therefrom, means for keying said bolt against rotation and frictionally resisting sliding movement thereof, said sliding bolt having a slotted forward end, a spindle threaded in said sliding bolt member and having a head of cam form for projecting into and expanding said slotted end on said bolt when said spindle is rotated relatively to said bolt, said swinging arm having means for coaction with said expansible head on said sliding bolt for clamping said arm in any desired position relatively to said clamping means.

6. In a door ajar holder to be attached to a door frame member and door member, a swinging arm to be attached to one of said members, clamping means to be attached to the other of said members, said clamping means including a bolt casing, a bolt slidable mounted therein so as to project from said casing into a position to lie athwart said swinging arm, said arm having a strike surface for camming said slidable bolt into retracted position when said door is moved to closed position.

7. In an ajar door holder, swinging arm means to be attached to a door casing, clamping means to be attached to a door, said swinging arm means including a housing to be attached to the door frame, an arm bracket in said housing and projecting to the outside thereof, a vertical pivot in said housing for pivotally mounting said arm bracket to swing about a vertical axis, spring means in said housing and cooperating with said bracket for urging the latter into normal position relatively to said bracket housing, a swinging arm pivotally mounted about a horizontal axis on the projecting part of said arm bracket, whereby said arm may swing about said horizontal axis and with said bracket may swing about a vertical axis, the rest position of said arm being substantially vertical along said door frame, said arm having a longitudinally extending slot therein with an enlarged upper end, said clamping means including a bolt case to be secured to a door, a bolt slidable in said case, means for frictionally resisting sliding of said bolt in said case, said bolt having a head thereon with a reduced shank in rear of said head, said head being positioned so as to project into the enlargement of said slot in said arm, whereby said bolt may be projected so as to cause said shank to be positioned in line with said slot and whereby when said door is opened said shank will ride within said slot and the head on said bolt will prevent disengagement of the shank from the slot, said projecting end of said bolt being slotted to render the same resilient, a spindle within said sliding bolt and in threaded engagement therewith, said spindle having a cam end fitting a cam seat in the forward end of said bolt, a handle for said spindle for rotating the latter so as to cause the cam end thereof to move forward and expand said shank into engagement with the sides of said slot for frictionally clamping the shank of said bolt in any desired position along the length of said slot, whereby the door may be held ajar to any extent desired within the limits of said arm.

8. In an ajar door holder to be secured to a door frame member and a door member, a swinging arm to be attached to one of said members, clamping means to be attached to the other of said members, said clamping means being engageable with said arm and slidable therealong, said clamping means including a bolt member including a part movable generally radially of the axis of said bolt member for gripping cooperation with said arm, said bolt-member axis being substantially perpendicular to the sliding path on said arm, said part of said bolt member being in gripping relation with said arm in one radially moved position and in releasing relation with said arm in another radially moved position, and manual actuating means for radially moving said part of said bolt member.

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