June 25, 1957 McFERRELL HOLLANSWORTH 2,797,119

TRUCK BODY DOOR HOLDER

Filed June 26, 1956 2 Sheets-Sheet 1

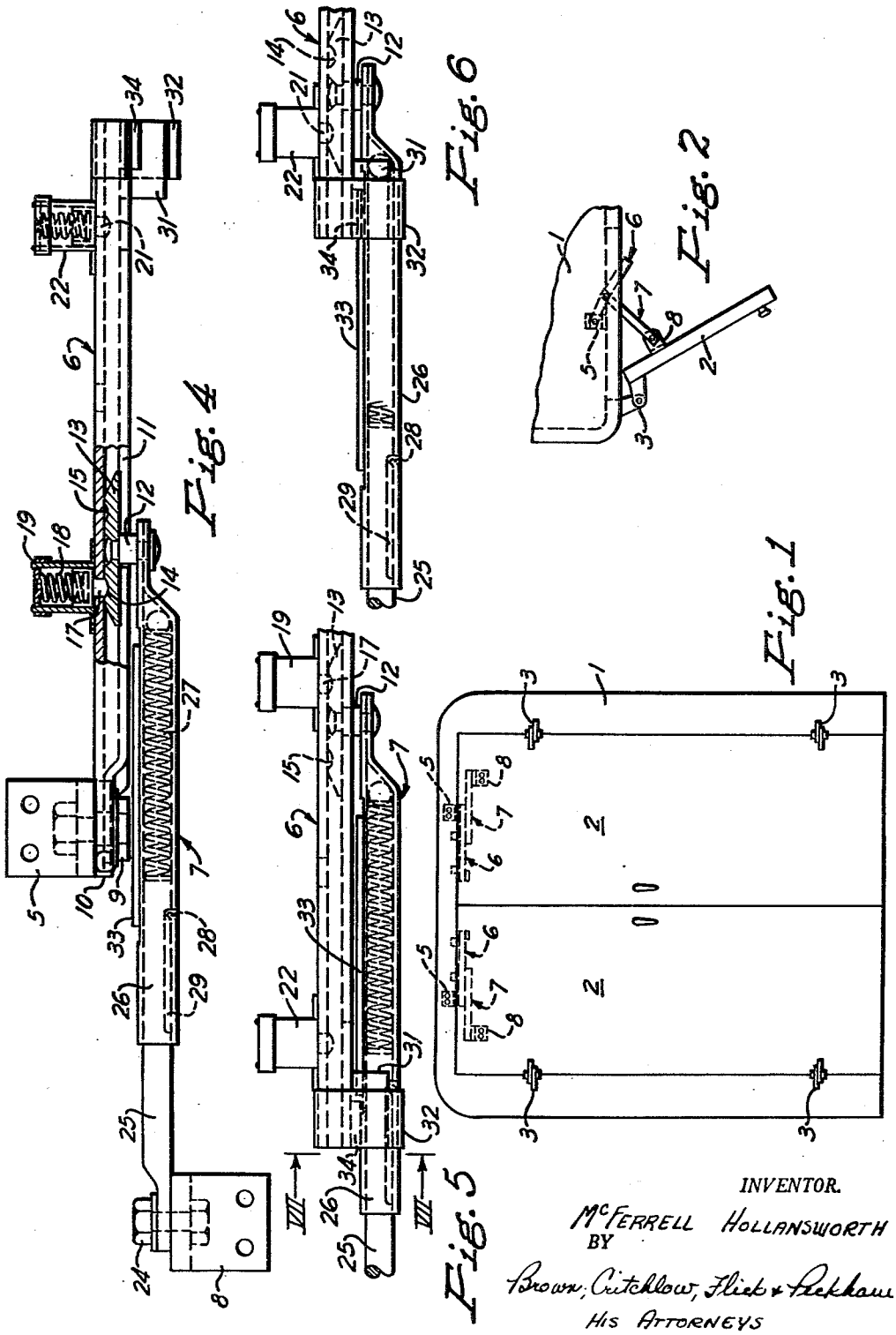


Fig. 1

Fig. 2

Fig. 4

Fig. 5

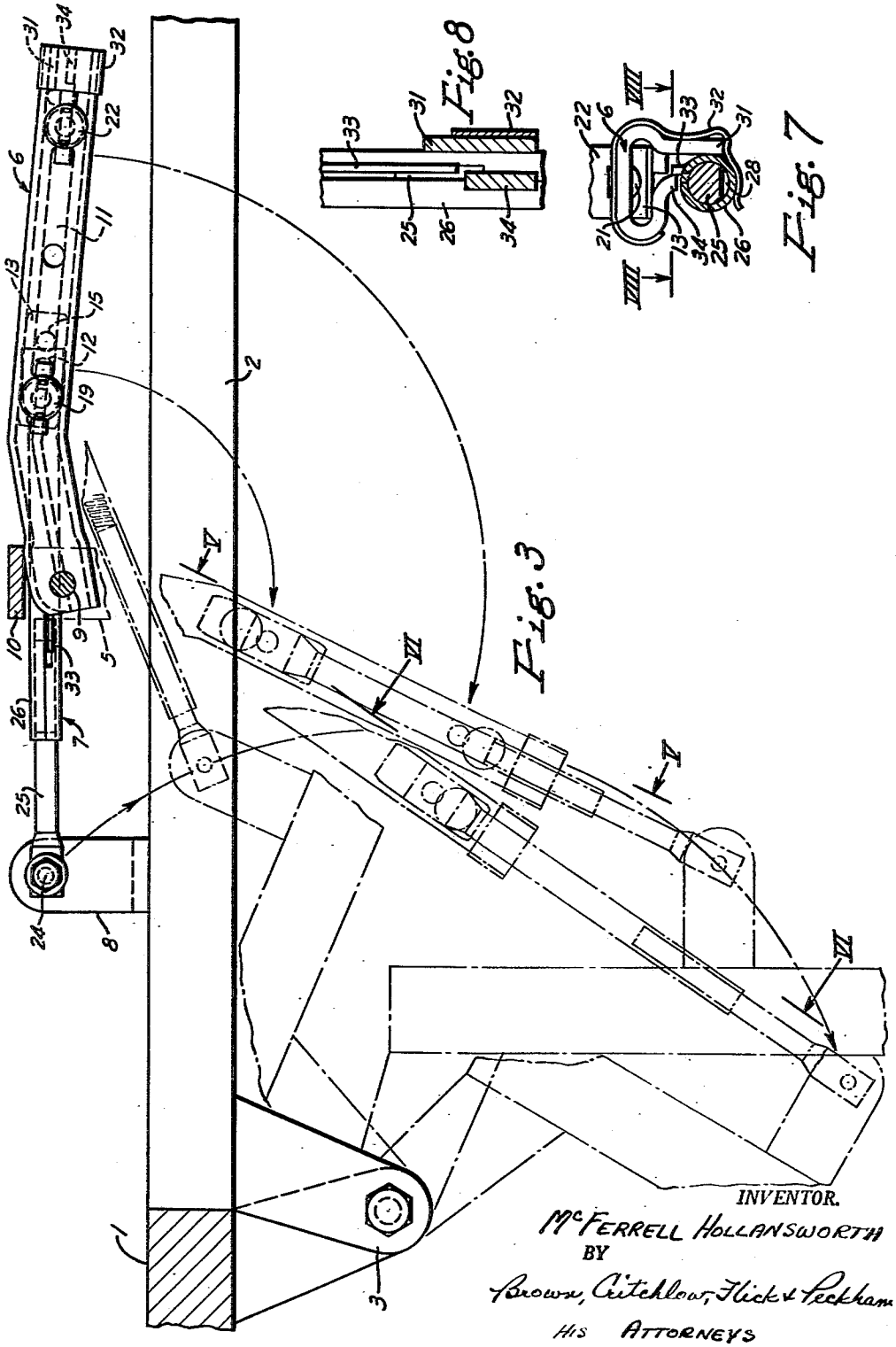
Fig. 6

INVENTOR.
McFERRELL HOLLANSWORTH
BY
Brown, Critchlow, Flick & Peckham
HIS ATTORNEYS

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INVENTOR.
McFERRELL HOLLANSWORTH
BY
Brown, Critchlow, Flick & Peckham
HIS ATTORNEYS

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TRUCK BODY DOOR HOLDER

McFerrell Hollansworth, Pittsburgh, Pa., assignor to McKinney Manufacturing Company, Pittsburgh, Pa., a corporation of Pennsylvania

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This invention relates to hinged braces for holding doors open in a plurality of different positions.

Various mechanisms have been provided for limiting the distance that a door can be swung open and then holding or bracing it in that position until it is desired to close the door. Generally these devices will hold the door open in only one position, and they require some element to be manipulated manually before they will allow the door to be closed again. This is objectionable where the door holder is difficult to reach, such as at the top of a door in the body of a truck.

It is among the objects of this invention to provide a door holder which will hold a door open in at least two different positions, and which is operated entirely by the door itself when a predetermined opening or closing pressure is applied to the door.

In accordance with this invention, an arm is pivotally connected at one end to the inside of a truck body or the like near the closed door and preferably at its top. The rest of the arm extends toward the edge of the door which is opposite to the edge that is hinged. One end of a link is pivotally and slidably connected to the arm for movement from an inner position near the pivoted end of the arm to an outer position near its free end. That end of the link normally is held in its inner position by friction means. The opposite end of the link is pivotally connected to the door, with the link extending under the arm-pivoting means while the door is shut. The arm and link are adapted to be swung outward into general alignment with each other when the door has been opened a predetermined distance. This will hold the door open. Means are provided for holding the link and arm in alignment when the link is pulled out to its outer position upon the door being pulled farther open. The link is held in this outer position by friction means. Preferably the arm is so shaped that the door can be closed by merely pushing against it hard enough to overcome the resistance of the friction means first, whereupon the link will move back to its inner position, and then to swing the link and arm out of alignment and inward through the door opening.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which

Fig. 1 is a view of the rear end of a truck body having doors provided with my holders;

Fig. 2 is a fragmentary plan view showing one of the doors opened part way;

Fig. 3 is an enlarged fragmentary plan view of my door holder with the door closed, and showing in broken lines different positions of the door and holder as the door is opened;

Fig. 4 is a further enlarged side view of the holder with a portion broken away;

Figs. 5 and 6 are fragmentary side views of the holder taken on the lines V—V and VI—VI, respectively, of dotted line positions in Fig. 3;

Fig. 7 is an enlarged cross section of the holder taken on the line VII—VII of Fig. 5; and

Fig. 8 is a fragmentary horizontal section taken on the line VIII—VIII of Fig. 7.

Referring to Figs. 1 and 2 of the drawings, the rear end of a truck body 1 is provided with a doorway that normally is closed by a pair of doors 2 connected at their outer edges to the body by suitable hinges 3 so that the two doors can be swung outward away from each other. Near the top of each door there is a holder for limiting the distance the doors can be opened, and for holding them in a plurality of different open positions. Each holder consists of four main parts; a bracket 5 fastened to the inside of the truck body above a door, an arm 6 having one end pivoted to the bracket, a link 7 pivoted to the arm, and a bracket 8 pivoted to the opposite end of the link and secured to the door near its top. When the doors are closed, the free end of each arm 6 extends toward the inner or free edges of the doors, and the adjoining link 7 extends from the arm outward under the body bracket 5 to the door bracket 8. This is the folded position of the holder indicated in Fig. 1 and as shown in detail in Figs. 3 and 4.

Referring now to Figs. 3, 4 and 7, the arm 6 is pivoted to the bottom of the body bracket 5 by a bolt 9, and inward swinging of the arm is limited by its engagement with a stop shoulder 10 on the bottom of the bracket. The arm is tubular, most suitably in the form of a flattened tube and it preferably has a dog-leg shape for a purpose that will be described later. In plan, the "joint" of the dog-leg is located closer to the body bracket than to the free end of the arm and is bent away from the door. The bottom of the longer straight section of the arm is provided with a slot 11 extending lengthwise thereof a predetermined distance. Extending through this slot and slidable along it is a vertical stud 12, the upper end of which is supported in the central part of a rectangular slide 13 that also can move lengthwise of the arm. The top of the slide, between the stud and the opposite ends of the slide, is provided with a pair of depressions 14 and 15, beyond which the ends of the slide are inclined. The slide can travel between an inner position in the arm near body bracket 5 and an outer position near the free end of the arm, the stud 12 engaging the end of the slot in both positions. In its inner position, the inner depressions of the slide receives a detent 17 slidably mounted in a hole in the top of the arm and pressed downward by a coil spring 18 compressed between the detent and the top of a small housing 19 secured to the top of the arm. Near the opposite end of the arm there is another spring-pressed detent 21 mounted in a housing 22 in the same way for projecting into the depression 15 near the outer end of the slide when the slide is moved to its outer position. By providing two depressions in the slide, it is unnecessary for the central stud to pass under either detent.

One end of link 7 is pivotally connected to the slide stud, and the other end of the link is pivotally connected to the door bracket 8 by a bolt 24. The link is a telescoping member because, with the arrangement shown in Fig. 3, it will be seen that as the door is opened, the door bracket moves closer to slide 13 for a certain distance, so the link must be shortened. However, for some hinge arrangements the bracket will not move closer to the slide and in such cases it is not necessary that the link telescope. The telescoping link is formed by slidably mounting a rod 25 in one end of a tube 26. Inside the tube there is a coil spring 27 that is compressed between the end of the rod and the opposite end portion of the tube. This tends to push the rod out of the tube, but separation is prevented by a lug 28 bent up from the bottom of the tube into a longitudinal slot 29 in the bottom of the rod. When the door starts to open, the rod is pushed into the tube to shorten the link, as indi-

cated in Fig. 3 but the rest of the time the spring holds the link fully extended.

As the door is opened, the door bracket first swings the adjoining end of the telescoping link out through the door opening, but the arm remains inside the truck body pressed against shoulder **10** on the door bracket. As soon as the door has opened far enough to permit the link to be fully extended, the link will start to pull on the arm and swing it out through the door opening as shown in Fig. 2. This continues until the door is opened 90°, as shown in Fig. 3, at which time the arm and link will be substantially in alignment although, of course, the link is below the arm. The slide is still held in its inner position by the inner detent **17**, as shown in Fig. 5. As the free end of the arm was swung outward and then toward the link, a stop **31** at its outer end struck the side of the link tube **26**. This stop can be formed by bending down a short section of the bottom of the arm, as shown in Fig. 7. As the stop approaches the link and engages it, a clamping spring **32** that also is mounted on the free end of the arm is brought into engagement with and grips the link to insure the link and arm remaining in alignment. As shown in Fig. 7, the spring is a bent strip of metal that is clamped around the arm and that extends down the outside of the stop and then inward toward the opposite side of the arm. The horizontal lower portion of the spring is provided with a concavity that receives the link and holds it until sufficient force is applied to the arm to slide the spring away from the link.

With the parts in the positions just described, the door is held open 90°. To close the door from this position, the free end of the arm **6** could be pulled laterally away from the link by hand in order to move the arm and link out of alignment with each other. However, where the arm has a dog-leg shape as described above, all that it is necessary to do is to apply enough closing pressure to the door to cause slide stud **12** to press against the inner end of the arm slot **11** hard enough to overcome the frictional engagement of clamping spring **32** with the link, so that the free end of the arm can swing back through the door opening and into the truck body. Pressure of the slide stud against the inner end of the arm slot will produce this action because the bend in the arm causes the pressure of the stud to exert itself along a line that passes some distance to the right of the pivotal connection between the arm and the body bracket as viewed in Fig. 3. This off-center force will swing the free end of the arm to the right and away from the link.

If, on the other hand, it is desired to open the door farther from its 90° open position, all that has to be done is to exert sufficient opening force on the door to overcome the frictional resistance between the slide and the inner detent engaging it, so that the door and link can pull the slide toward the free end of the arm until the outer detent **21** snaps into the outer depression **15** in the slide. The slide then will be held in this outer position and, since the length of the holder or brace now has been increased, the door will be held farther open, such as at an angle of 120° for example.

As an extra precaution against the arm and link being swung out of alignment while the slide is not in the inner position, a rib **33** is provided along the top of the link tube **26** for sliding along one side of a lug **34** bent down from the bottom of the outer end of the arm above the center of the link. As shown in Fig. 7, the rib preferably is formed by bending up a strip of the link tube at the side of the lug next to stop **31**. When slide **13** is in its inner position at the 90° door-open position shown in Figs. 5 and 8, the lug is slightly beyond the outer end of the rib, so the rib does not interfere with the free end of the arm swinging into and out of alignment with the link at that time. However, as soon as the door is swung farther open, rib **33** is pulled outward between lug **34** and stop **31** and thereby positively prevents the arm from swinging back away from the link.

To close the door from its farthest open position, sufficient closing pressure is applied to it to overcome the frictional resistance between the outer detent **21** and the slide. The link then will push the slide back through the arm to its inner position and the rib will be moved away from the lug. Continued pressure applied to the door will cause clamping spring **32** to release the link and the free end of the arm to swing away from the link as explained above. The link and arm will both swing back through the door opening into folded position as the door is shut. As far as this invention is concerned, it is immaterial whether the link is above or below the arm; either position being considered the equivalent of the other.

Consequently, with this invention the door can be opened to different positions by merely pulling on it, it will be held open in the desired position against normal forces tending to close it, and it can be shut by merely pushing on it hard enough to overcome the frictional resistance of the springs.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A holder for a truck door that is hinged near one edge to a truck body, said holder comprising an arm, means for pivotally connecting one end of the arm to the inside of the truck body near the closed door with the rest of the arm extending toward the free edge of the door, a link having one end pivotally and slidably connected to the arm for movement from an inner position near the pivoted end of the arm to an outer position near its free end, friction means normally holding said end of the link in its inner position, means for pivotally connecting the opposite end of the link to the door with the link extending under said arm-pivoting means while the door is shut, the arm and link being adapted to be swung outward into general alignment with each other when the door has been opened a predetermined distance, means holding the link and arm in alignment when the link is pulled out to said outer position when the door is pulled farther open, and friction means for holding the link in said outer position.

2. A holder for a truck door that is hinged near one edge to a truck body, said holder comprising an arm, means for pivotally connecting one end of the arm to the inside of the truck body near the closed door with the rest of the arm extending toward the free edge of the door, a link having one end pivotally and slidably connected to the arm for movement from an inner position near the pivoted end of the arm to an outer position near its free end, friction means normally holding said end of the link in its inner position, means for pivotally connecting the opposite end of the link to the door with the link extending under said arm-pivoting means while the door is shut, a stop carried by the free end of the arm for engaging one side of the link when the door has been opened far enough to swing the arm and link into general alignment, means holding the link and arm in alignment while the lnik is pulled out to said outer position as the door is pulled farther open, and friction means for holding the link in said outer position.

3. A holder for a truck door that is hinged near one edge to a truck body, said holder comprising an arm, means for pivotally connecting one end of the arm to the inside of the truck body near the closed door with the rest of the arm extending toward the free edge of the door, a link having one end pivotally and slidably connected to the arm for movement from an inner posi-

tion near the pivoted end of the arm to an outer position near its free end, friction means normally holding said end of the link in its inner position, means for pivotally connecting the opposite end of the link to the door with the link extending under said arm-pivoting means while the door is shut, the arm and link being adapted to be swung outward into general alignment with each other when the door has been opened a predetermined distance, a rib extending along the link and projecting toward the plane of movement of the arm, a lug projecting from the free end of the arm in position to move across the outer end of said rib when the link and arm are swung into said alignment, whereby when the link is pulled out to said outer position as the door is pulled farther open the rib will move along the side of the lug and prevent the link and arm from swinging back out of said alignment, and friction means for holding the link in said outer position.

4. A holder for a truck door that is hinged near one edge to a truck body, said holder comprising an arm, means for pivotally connecting one end of the arm to the inside of the truck body near the closed door with the rest of the arm extending toward the free edge of the door, a slide carried by the arm for movement from an inner position near the pivoted end of the arm to an outer position near its free end, friction means normally holding the slide in its inner position, a link having an end pivotally connected with the slide, means for pivotally connecting the opposite end of the link to the door with the link extending under said arm-pivoting means while the door is shut, the arm and link being adapted to be swung outward into general alignment with each other when the door has been opened a predetermined distance, means holding the link and arm in alignment while the slide is pulled out to said outer position as the door is pulled farther open, and friction means for holding the slide in said outer position.

5. A holder for a truck door that is hinged near one edge to a truck body, said holder comprising a tubular arm, means for pivotally connecting one end of the arm to the inside of the truck body near the closed door with the rest of the arm extending toward the free edge of the door, the arm being provided with a longitudinally extending slot, a slide inside the arm movable from an inner position near the pivoted end of the arm to an outer position near its free end, a spring-pressed detent in the arm normally holiding the slide in its inner position, a link, means extending through said arm slot pivotally connecting one end of the link with the slide, means for pivotally connecting the opposite end of the link to the door with the link extending under said arm-pivoting means while the door is shut, the arm and link being adapted to be swung outward into general alignment with each other when the door has been opened a predetermined distance, means holding the link and arm in alignment while the slide is pulled out to said outer position as the door is pulled farther open, and friction means for holding the slide in said outer position.

6. A holder for a truck door that is hinged near one edge to a truck body, said holder comprising an arm, means for pivotally connecting one end of the arm to the inside of the truck body near the closed door with the rest of the arm extending toward the free edge of the door, a telescoping link formed from slidably connected inner and outer members urged apart axially by a coil spring inside the outer member, means pivotally and slidably connecting the end of said outer member farthest from the inner member to the arm for movement from an inner position near the pivoted end of the arm to an outer position near its free end, friction means normally holding said end of the outer member in its inner position, means for pivotally connecting the opposite end of the link to the door with the link extending under said arm-pivoting means while the door is shut, the arm and link being adapted to be swung outward into general alignment with each other when the door has been opened a predetermined distance, means holding the link and arm in alignment when the link is pulled out to said outer position when the door is pulled farther open, and friction means for holding the link in said outer position.

7. A door holder according to claim 1, in which said arm is dog-leg shape and bent away from the door.

8. A door holder according to claim 1, including a spring mounted on the free end of the arm and receiving and gripping said link when the arm and link are swung into said general alignment.

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