

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO COLLAPSIBLE SHUTTER GATES

(71) We, BOLTON GATE COMPANY LIMITED, a British Company of Turton Street, Bolton, Lancashire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a collapsible shutter gate.

Collapsible shutter gates are well known and as used in this specification the term "collapsible shutter gates" is intended to mean gates of the kind which comprise a plurality of vertically disposed uprights called pickets connected together by a system of lattice bars in the manner of lazy-tongs and shutter leaves hingedly connected to the pickets. Previously these gates were constructed of a number of different components and involved hand rivetting during assembly of the lattice bars to the pickets.

Accordingly the present invention provides a collapsible shutter gate as hereinbefore defined comprising a plurality of vertically disposed uprights connected by lattice members, each upright comprising a first channel sectioned member, having a shutter leaf hingedly connected thereto, a second channel sectioned member having its web secured to the web of the first channel member such that the open sides of the first and second channel members are directed away from each other and a third channel sectioned member, means locating said third channel member spaced apart from and parallel to said first and second channel members with the open sides of the second and third channel members being directed towards each other, said locating means comprising pivots for said lattice members extending between the second and third channel members through the open sides thereof.

[Price 25p]

In a preferred embodiment of the invention all the channel members have the same cross-sectional form so that the first, second and third channel members are interchangeable. The preferred cross-sectional form of the channel members comprises a web from each side of which arcuate flanges extend so as to provide concave surfaces within the channel member.

Alternatively the channel members may comprise a web having plane flanges extending from each side thereof, preferably at substantially right angles to the plane of the web, the free ends of the flanges being intumed and directed towards each other, the intumed portions being bent at right angles to their associated flanges. Further the free ends of the intumed portions may be bent through a further 90° so that the said free ends are directed towards the inside face of the web.

The pivots for the lattice members may comprise bolts or studs which extend through appropriately sized apertures in the webs of the channel members.

Pivots for the lattice members may also comprise bolts or pins having a head at each end thereof, one head of each said bolt or pin being accommodated within the second channel member and the other head being accommodated within the third channel member. This form of pivot for the lattice members is movable vertically relative to the channel members and to assist such movement the heads may be formed as rollers which ride on the inner surfaces of the flanges of said second and third channel members.

Specific embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:—

Fig. 1 shows a collapsible shutter gate in rear elevation and fully extended;

Fig. 2 shows the shutter gate of Fig. 1 in 90

end elevation;

Fig. 3 is a section taken on the line A-A of Fig. 1.

Fig. 4 shows diagrammatically the assembly at the location marked E in Fig. 2;

Fig. 5 shows diagrammatically the assembly at the locations marked D in Fig. 2;

Fig. 6 is a section taken on the line B-B of Fig. 1; and

Fig. 7 is a section taken on the line C-C of Fig. 1;

Referring to Figs. 1 and 2 a collapsible shutter gate comprises a plurality of pickets 10 which are interconnected by lattice bars 12 arranged in the manner of a lazy tong system. Shutter leaves 14 are hingedly connected to the pickets as is known per se so that when the gate is collapsed the shutter leaves will fold concertina fashion. Each picket has lattice bars connected thereto by pivots 16 in the upper portion of each picket, 18 at substantially the midpoint of each picket and 20 in the lower portion of each picket. (It will be understood that the specific embodiment shown in the drawings is a gate of a height which only requires one row of lattice bars. Gates of greater height will require two or more rows of lattice bars in which case the pivots 16, 18 and 20 for each row would be in different locations to those shown in the drawings). As is known the pivots 16 and 20 must move vertically upwards and downwards relative to the pickets on closing and opening respectively of the gate, the location of pivots 18 during such opening and closing remaining fixed relative to the pickets.

As can be seen in Figs. 3, 4 and 5 and particularly in Fig. 5, each picket comprises channel-sectioned members 22, 24 and 26 of the same cross-sectional form. The channel-sectioned members are preferably of cold rolled steel and comprise a web 28 from each side of which arcuate flanges 30 extend providing concave surfaces within the said members. The first and second channel-sectioned members 22 and 24 have their webs secured to each other so that their open sides 32, 34 respectively are directed away from each other. The third channel member 26 is spaced apart from, and parallel to, member 24, the open side 38 of the third member being opposite the open side 34 of the second member. Fig. 3 shows in more detail a pivot 16 or 20 which is vertically movable relative to the pickets. The pivot comprises a pin 40 having a roller 42 rotatably mounted adjacent each end thereof. The rollers are retained within the second and third channel members with the pin extending substantially horizontally therebetween and through apertures in the

lattice bars 12 so that the said bars may pivot relative to the pin. Washers 44 are provided to assist the pivoting of the lattice bars in accordance with normal practice. The diameter of the pin is chosen such that it will not engage the flanges of member 24 and 26 and such that on vertical movement of the pivot each roller rides on the inner surface of one or other flange of the associated channel member.

Pivots 16 and 20 may if desired merely consist of a pin extending between the second and third channel-members, which pin will ride on the flanges of said members during vertical movement of the pivots. In this arrangement if channel members are employed having a cross-sectional form similar to that shown in the drawings the pins will ride on the edges of the flanges so that it may be preferable to use channel-members in which the flanges extend at substantially right angles to the plane of the web, the free ends of said flanges being intumed towards each other and the free ends of the intumed portions being bent through a further 90° in which case the pins will ride on a substantially flat face.

A pivot 18 is shown in more detail in Fig. 4. This form of pivot, which is fixed relative to the pickets, comprises a bolt 50 which extends through appropriately formed apertures in the webs of all three channel-members. The bolt is provided with at one end a head 52 which engages against the inner surface of the web of the first channel-member 22. The other end of the bolt is threaded to receive a nut 54. As can be seen in Fig. 4 the bolt extends through apertures in two lattice bars 12, four washers 44 being provided as in the pivot shown in Fig. 3. Thus the distance between the second and third channel members at pivot 18 is substantially the same as at the pivots 16 and 20. However, to prevent the bolt from being tightened to an extent that might inhibit pivoting of the lattice bars on the bolt 50 the threading at the end of the bolt may extend only a predetermined distance along the shank thereof.

Alternatively the same result can be attained by a shoulder provided on the bolt 50 against which the inside face of the web of the third member will engage when the nut 52 is tightened.

It is not normally practical to rely upon the pivots 16, 18 and 20 to maintain the third channel member in firm but spaced apart relationship to the first and second channel members. Hence at selected intervals along each picket a distance piece 56 such as shown in Fig. 5 is secured between the second and third channel members by means of a bolt 50 and nut 54

similar to that used in the pivot shown in Fig. 4. The thickness of the distance piece is equal to, or substantially equal to, the thickness of two lattice bars 12 and four washers 44.

As will be apparent the shutter leaves are hingedly connected to the first channel members of the pickets.

The manner in which leaves are connected to the pickets will depend, inter alia, on the cross-sectional form of the first channel members but within that limitation any of the currently proposed methods of connecting the leaves to the pickets can be used.

As in previously proposed shutter gates two leaves are connected to each picket except the two pickets, one at each end of the door, to which only one leaf is connected as illustrated in Figs. 6 and 7. To fix one end of the door to a jamb, therefore, a plate 60 is hingedly connected to the first channel member in a manner such as is employed for hinging a shutter leaf thereto, (Fig. 6). The plate can then be fixed to a jamb by any suitable means such as screws.

In a similar fashion, and as shown in Fig. 7, a suitably fashioned member 62, is connected to the front end picket to act as locking means for the gate. It will be observed that not only is one side of the plate 62 hingedly connected to the first channel member of the front end picket, but the other side of plate 62 is secured to a bolt 50 which may be the bolt of a pivot 18 or the bolt securing a distance piece 56. It will be understood that plate 60 can be similarly secured if desired.

WHAT WE CLAIM IS:—

1. A collapsible shutter gate as hereinbefore defined comprising a plurality of vertically disposed uprights connected by lattice members, each upright comprising a first channel sectioned member, having a shutter leaf hingedly connected thereto, a second channel sectioned member having its web secured to the web of the first channel member such that the open sides of the first and second channel members are directed away from each other and a third channel sectioned member, means locating said third channel member spaced apart from and parallel to said first and second channel members with the open sides of the second and third channel members being directed towards each other, said locating means comprising pivots for said lattice members extending between the second and third channel members through the open sides thereof.

2. A collapsible shutter gate as claimed in Claim 1, wherein all the channel members have the same cross-sectional form so that the first, second and third channel

members are interchangeable.

3. A collapsible shutter gate as claimed in Claim 1 or Claim 2, wherein one or more of the channel members comprises a web from each side of which arcuate flanges extend so as to provide concave surfaces within the or each channel member.

4. A collapsible shutter gate as claimed in any preceding claim, wherein one or more of the channel members comprises a web having plane flanges extending from each side thereof, the free ends of the flanges being intumed and directed towards each other.

5. A collapsible shutter gate as claimed in Claim 4, wherein the free ends of the intumed portions are further intumed so that the free ends are directed towards the inside face of the web.

6. A collapsible shutter gate as claimed in any preceding claim, wherein at least some of the pivots for the lattice members comprise bolts or studs which extend through appropriately sized apertures in the webs of the channel members.

7. A collapsible shutter gate as claimed in any preceding claim, wherein at least some of the pivots for the lattice members comprise bolts having a head at each end thereof, one head of each said bolt being accommodated within the second channel member and the other head of each said bolt being accommodated within the third channel member.

8. A collapsible shutter gate as claimed in Claim 7, wherein the heads of each bolt are formed as rollers which ride on the inner surface of the flanges of the second and third channel members.

9. A collapsible shutter gate as claimed in any preceding claim, wherein a plate for fixing the gate to a jamb or like support is provided with a flange which flange is slidably received in the first channel member at one end of the gate.

10. A collapsible shutter gate as claimed in any preceding claim wherein a U-shaped member has a flange formed at the free end of one arm, which flange is slidably received in the first channel member at the leading end of the gate, the other arm of the U-shaped member being pivotally secured on one of the pivots for lattice members at the leading end of the gate.

11. A collapsible shutter gate substantially as described herein with reference to the accompanying drawings.

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