May 14, 1946. E. G. JOHNSON 2,400,421

CLOCHE, GREENHOUSE, AND THE LIKE

Filed May 31, 1945

FIG. 1.

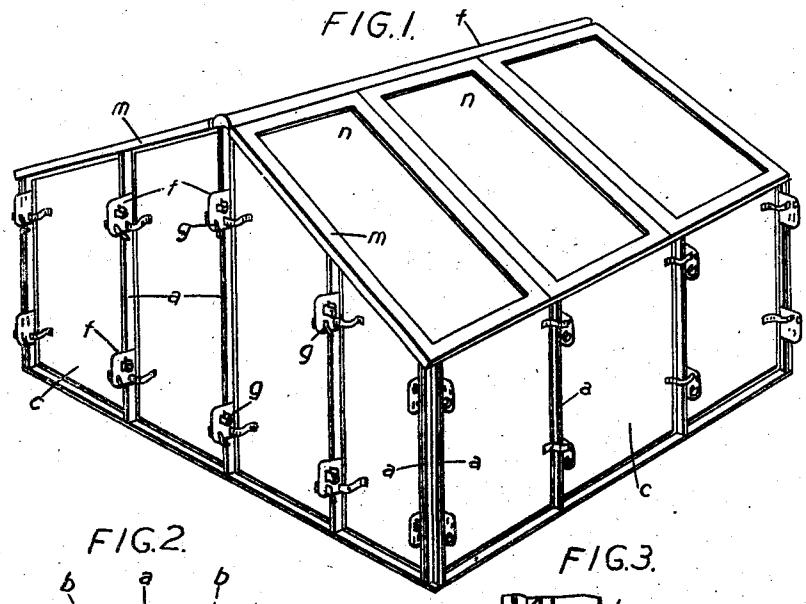


FIG. 2.

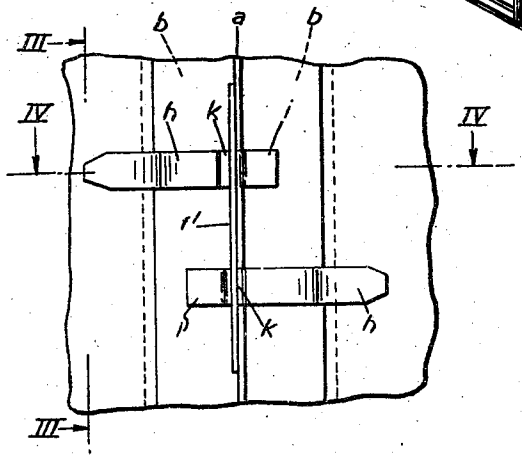


FIG. 3.

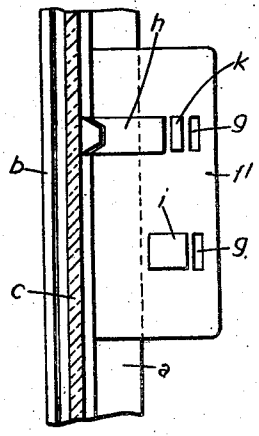


FIG. 4.

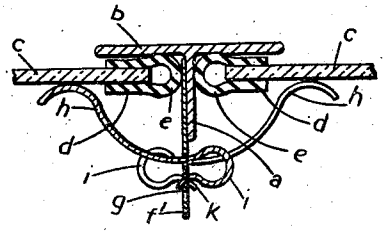
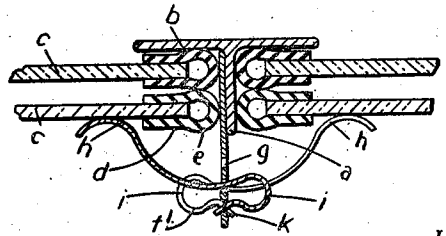


FIG. 5.



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CLOCHE, GREENHOUSE, AND THE LIKE

Eric Goddard Johnson, Spalding, England

Application May 31, 1945, Serial No. 596,956
In Great Britain June 9, 1944

4 Claims. (Cl. 189—78)

This invention relates to the construction of cloches, greenhouses and the like in which panes of glass are fixed in metal frames and a simple device is required for fastening each pane of glass in position. What is required is some resilient support for the glass which will avoid damage to it in case it does not precisely fit the frame, or if the glass or the frame is not perfectly flat, and at the same time the glass should make a substantially airtight joint with the frame.

It is the object of the present invention to provide a securing device for holding the panes of glass in the metal frames, which securing device will hold the glass resiliently and allow for its easy replacement and removal when required. It is a further object to provide a spring clip and a lug for holding the same which will enable the resilient pressure to be applied to the glass panes in the frame. A still further object is to enable spring clips to be adjustably mounted in the lugs with a view to accommodating additional panes of glass when required.

According to the present invention a securing device is provided for holding panes of glass in metal frames such as are used in cloches, greenhouses and the like wherein the edges of the glass panes are fitted with a resilient beading upon which they rest in the frames, and lugs are provided on the frames, each formed with two or more slots, and bent spring clips are provided each having a looped portion whereby it engages in two of the slots in a lug, and having also a projecting curved arm adapted to bear against a pane of glass near its edge when the looped portion is engaging in the slots in the lug. If each lug has three or more slots in a row, the clips can be adjusted to other positions for securing double glazing if required in the frames. Each lug may have two sets of slots to accommodate the clips extending in opposite directions, to hold panes of glass in the frames at each side of the lug.

The invention is illustrated by way of example in the accompanying drawing, in which:

Figure 1 is a perspective view of a cloche to which the invention is applied;

Figure 2 is a detailed view of one of the lugs and two of the spring clips as seen from the front;

Figure 3 is a sectional view looking in the direction of the arrows III—III in Figure 2;

Figure 4 is a sectional view looking in the direction of the arrows IV—IV in Figure 2; and

Figure 5 is a sectional view corresponding with Figure 4, but showing the clips holding double glazing in the frames.

Referring first to Figure 1, the metal frame of the cloche there shown has projecting flanges *a* between the panes of glass *c* and each flange carries lugs *f*, provided with sets of slots *g* for receiving the spring clips. The cloche is closed at the top by wooden frames *m* carrying panes of glass *n*, the wooden frames resting on the top of the metal frame structure.

Each pane of glass *c* is fitted round its edges with a moulded beading of rubber or the like, as seen in Figure 4, the beading having portions *d* which embrace the glass pane and a looped portion *e* which extends beyond it. Each pane of glass when provided with its beading is inserted so as to rest against the bases *b* of the frame members between the flanges *a*, and is secured in position by the spring clips, as shown. Each clip has a curved, projecting arm *h* for bearing against the glass plate and a looped portion *i* terminating in a tongue *k* by means of which the clip is held in two of the slots of the lug, as shown. In Figure 1 each lug has two pairs of slots for engagement by clips extending one to one side and one to the other side of a flange *a*. In Figures 2 to 5 the lugs are marked *f'* and each has two rows of three slots *g*. When single glazing is used as shown in Figures 2, 3 and 4, the clip *h* is engaged by its looped portion *i* and the tongue *k* with the two inner slots in the plate *f'* but when double glazing is used, as shown in Figure 5, the clip is engaged with the two outer slots in the lug *f'* as shown in this figure. The pressure of the clip normally flattens back the beading somewhat, pressing it into close contact with the frame and pressing the beadings together when double glazing is used, as in Figure 5, but the beading is shown uncompressed in Figures 4 and 5 to illustrate its normal form.

With the construction illustrated it will be seen that it is easy to remove any pane of glass when required, by pressing together a tongue *k* and arm *h* of a spring sufficiently to enable the spring to be pushed backwardly through the slots in its lug, and when the four clips holding a pane are thus released, the pane can be removed by hand. When the pane is replaced the clips are brought into engagement again by pressing the tongues *k* inwardly until they will engage in the appropriate slots *g* in the lugs *f* or *f'*.

All the lugs *f* or *f'* for a cloche or greenhouse are preferably made of a standard pattern and they may be spot-welded, riveted or otherwise secured to the flanges *a* of the metal frames in appropriate positions, such as are illustrated in Figure 1. If each lug has three or more slots in a row the frame can be used either for single or

double glazing, as required. Double glazing, of course, provides substantially more protection against external changes of temperature and is used where such protection is desired.

The beading used around the edges of the glass frames is obtainable in the form of a standard article in long lengths which can be cut into portions fitting the sides, tops and bottoms of the panes, or they may be notched at intervals, if required, to facilitate bending a single length around the four corners of a pane, as will be obvious. Although rubber has been mentioned as a suitable material for the beading, it will be obvious that other resilient materials may be used, but rubber has the advantage of combining resilience with resistance to moisture. The spring clips are not necessarily of the precise shape shown, provided that they have portions which will engage simultaneously in the slots in a lug or attachment whereby each clip is held in a position such that one arm exerts the required spring pressure on the glass pane. The projecting arms of the clips are preferably rounded or curved, as shown, so as to exert pressure by a smooth surface on the glass.

I claim:

1. The combination with a recessed metal frame of a plurality of lugs projecting from the frame, each with a plurality of slots in it, a plurality of spring clips each having a looped portion with two projecting arms, one of said arms being longer than the other and curved to provide a pressing surface, and a pane of glass with means for resiliently supporting it around its edges within the recess of said frame, said spring clips being adapted each to engage in two slots in said lugs in a position such that the longer arm of each such spring clip exerts pressure on the glass pane in said frame.

2. The combination with a recessed metal frame of a plurality of lugs projecting from the frame, each with a plurality of slots in it, a plurality of spring clips each having a looped portion with two projecting arms, one of said arms being longer than the other and curved to provide a pressing surface, a pane of glass and resilient beading upon the edges of said pane of glass adapted to support it resiliently in said metal frame, said spring clips being adapted each to engage in two slots in one of said lugs in a position such that the longer arm of each such spring clip exerts pressure on the glass pane in said frame.

3. The combination with a recessed metal frame of a glass pane and resilient means for cushioning said glass pane where it contacts with the recess of said metal frame, a plurality of lugs on said metal frame formed with slots therein, and a plurality of spring clips each having two arms adapted to engage resiliently with adjacent slots in said lugs, each spring clip having one arm elongated and curved backwardly, each spring clip being engaged with its two arms projecting through adjacent slots in one of said lugs, the shorter arm projecting outwardly and the longer arm projecting inwardly to bear against the surface of said pane of glass.

4. The combination with a recessed metal frame of a glass pane and resilient means for cushioning said glass pane where it contacts with said metal frame, a plurality of lugs on said metal frame each provided with at least three slots one beyond another therein, and a plurality of spring clips each with a looped portion and two projecting arms one longer than the other, adapted to engage in adjacent slots in said lugs, the longer arm of each such clip being curved to provide a rounded surface for bearing against said pane of glass, each such clip being adapted for engagement with any adjacent pair of slots in its lug whereby said spring clips are adjustable in position to accommodate panes of glass at varying depths within said metal frame.

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