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SUPPORTS FOR ROOF AND THE LIKE

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Fig. 1.

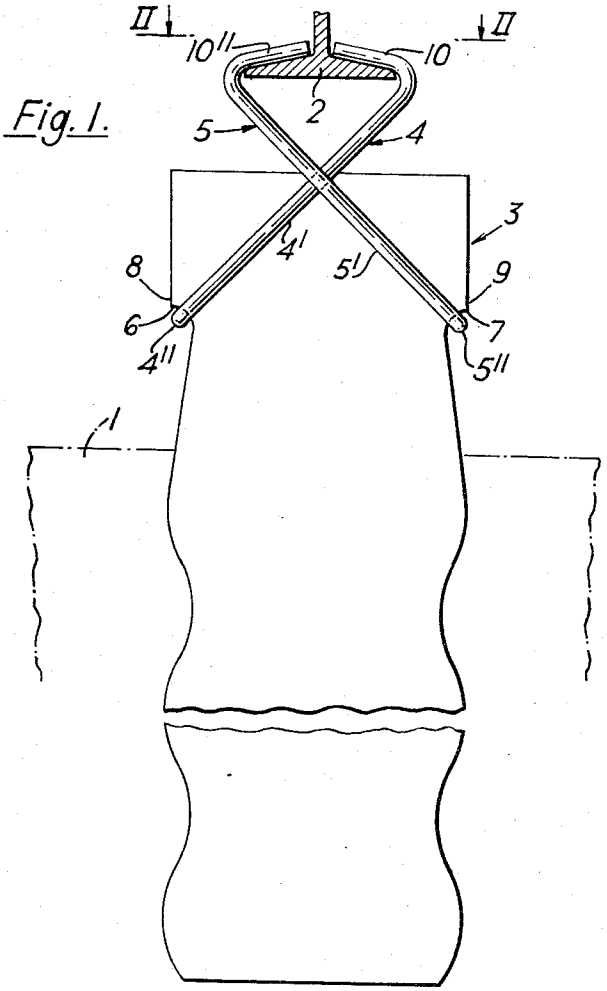

Fig. 2.

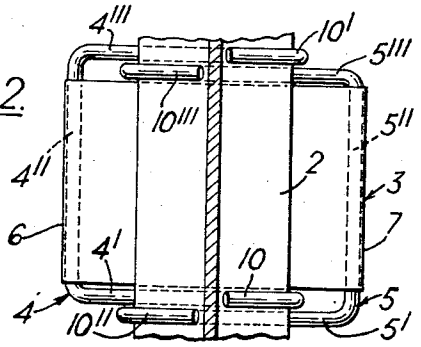

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Fig. 3.

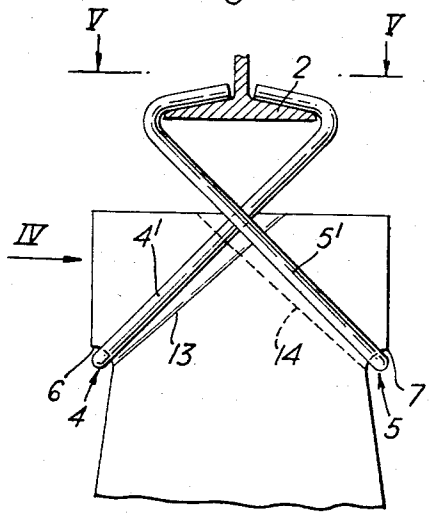

Fig. 4.

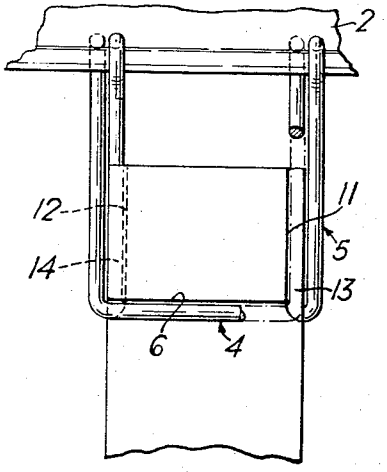

Fig. 5.

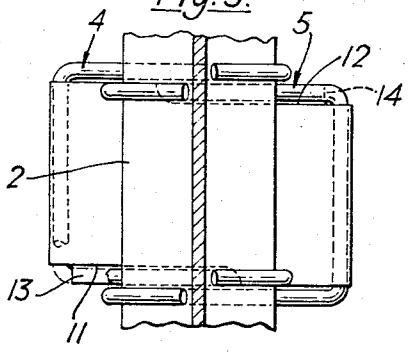

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Fig. 6.

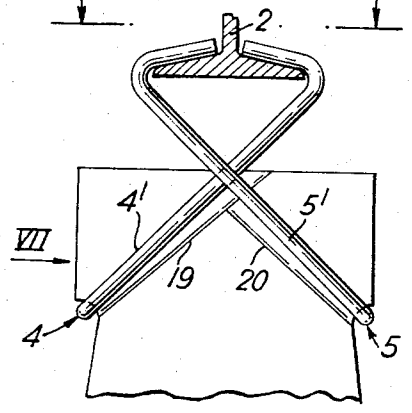


Fig. 7.

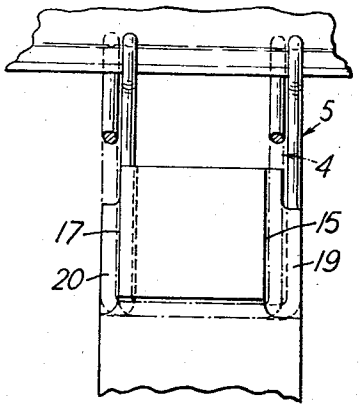
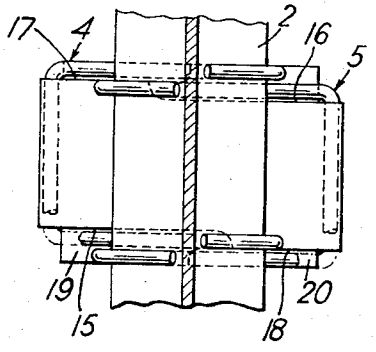


Fig. 8.



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SUPPORTS FOR ROOF AND THE LIKE

Alexander Low Birse, Bonnybridge, Scotland, assignor to John G. Stein & Company Limited, Bonnybridge, Scotland, a British company

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Claims priority, application Great Britain, Mar. 29, 1965, 13,251/65

3 Claims. (Cl. 110—99)

It is common practice to form the roof and sometimes the side walls of some furnaces such as soaking pits, tunnel kilns, slab furnaces and other heat-treatment furnaces, as well as flue ducts and similar structures, in monolithic construction, from plastic or castable refractories which require suspension and support. The suspension may be effected in various ways, one of these comprising hanging bricks (commonly known as hanger bricks) on steel girders of I or T section at intervals and ramming or casting the roof or other structure around the lower parts of these bricks.

One such brick is shown in position in FIGURES 1 and 2 of the accompanying drawings, FIGURE 1 being an elevation partly in section and FIGURE 2 a section on the line II—II in FIGURE 1.

Part of one brick according to the invention is shown in FIGURES 3, 4 and 5 of the accompanying drawings, FIGURE 3 being a side elevation, FIGURE 4 being an end elevation looking in the direction of the arrows IV in FIGURE 3, and FIGURE 5 being a section on the line V—V in FIGURE 3; and part of another brick is shown in similar FIGURES 6, 7 and 8.

As shown in FIGURES 1 and 2 a monolithic furnace roof **1** is to be supported from steel girders, one of which is shown at **2**. Hanger bricks, one of which is shown at **3**, are suspended frim each girder **2**, and except for their upper parts are embedded in the roof **1**, which is actually formed around them. The connection between the girder **2** and each brick **3** consists of a pair of clips **4** and **5** of U-shape. Recesses **6** and **7** are formed in the end faces of the brick at a little distance below the top so as to leave flanges **8** and **9** above the recesses. The clips **4** and **5** are of such dimensions that each will fit over the top of the brick with its arms extending along opposite side faces and its base in one of the end recesses **6** and **7**. As shown, one arm **4'** of the clip **4** is in contact with a side face of the brick and the base **4''** of this clip bears against the underside of the flange **8**. An arm **5'** of the clip **5** crosses the arm **4'** and so is out of contact with the side face of the brick, while the base **5''** of this clip bears against the underside of the flange **9**. On the opposite side face the relative position of the other arms **4'''** and **5'''** of the clips **4** and **5** is reversed, the arm **4'''** being outside the arm **5'''**.

Each arm is bent to form a hook. There are thus four hooks, those of the clip **4** being numbered **10** and **10'** and engaging one flange of the girder **2** and those of the clip **5** being numbered **10''** and **10'''** and engaging the other flange. The action of the clips is thus of a scissors nature, and so long as the weight of the roof is pulling each clip downwards the tendency is for the hook ends to move towards one another.

Now roofs and other structures of the kind described, to which the invention relates, sometimes lift as the result of thermal effect. When they do, one or more pairs

of clips are effectively relieved of load. In consequence the clips may rock downwards about their bases as axes, that is to say the hook ends of the two clips may move apart, and the clips may cease to engage the girder.

According to the invention this disadvantage is avoided by recessing the upper corner of a side face from each end recess to the top of the brick to form an inclined ledge for an arm of the clip that engages in the end recess in question. Each ledge limits the downward rocking movement of one clip, and therefore the extent to which the hook ends of the clip can move away from the girder.

The number and position of the recesses may vary, the minimum being two recesses, one for an arm of each clip. If there are only two recesses they are preferably made at diagonally opposite corners of the brick.

It is of course desirable that all the clips should be identical in size and shape. Identical clips can be used even if two recesses are not made at diagonally opposite corners of the brick, since both recesses may be in one side face if one recess is made deeper than the other.

In the preferred construction there are recesses across all four upper corners, one pair of diagonally opposite recesses being deeper than the other pair, to provide four ledges for the arms of the two clips. In this case all the clips may be of the same size and shape, and none will extend outwards beyond either side face if the depth of the deeper recesses is at least equal to twice the thickness of the arms of the clips.

Referring first to FIGURES 3 to 5, two recesses are made at diagonally opposite corners of the brick and are shown at **11** and **12**, the side recess **11** running from the end recess **6** and the side recess **12** running from the end recess **7** to provide ledges **13** and **14** respectively. The angle of inclination of each ledge is less than that of the corresponding clip, so that some downward rocking movement of the clip can take place before the arm bears firmly against the ledge.

The dimensions of the clips, which are commonly made of mild or stainless steel rod, are such that each clip will fit over the recessed part of the top of the brick with slight clearance, and then on one side face of the brick an arm **4'** of the clip lies substantially in the recess **11** and can make contact with the ledge **13**, while the intersecting arm **5'** of the other clip **5** lies outside the arm **4'** but in contact with it. On the opposite side face the arm of the clip **5** lies in the recess **12** and the arm of the clip **4** is outside the arm of the clip **5**.

The preferred construction is shown in FIGURES 6 to 8. Here there are recesses across all four corners, one pair of diagonally opposite recesses **15** and **16** being deeper than the other pair **17** and **18**. The arm **4'** can bear against the ledge **19** formed by the base of the recess **15** and the opposite arm of the clip **4** against the ledge formed by the base of the recess **17**. The arm **5'** of the other clip lies outside the arm **4'** and can bear against the ledge **20** formed by the base of the recess **18**, and the other arm of this clip can bear against the ledge formed by the base of the recess **16**. It will be seen that two identical clips can be used and all four arms are given support.

I claim:

1. For use in supporting a monolithic refractory structure, a hanger brick with a rectangular head presenting side and end faces, said end faces being formed with recesses to receive the bases of U-shaped clips, the arms of which extend along the side wall and terminate in hooks,

said brick being formed with two further recesses each made in a side face across an upper corner from each end recess to the top of the brick to form an inclined ledge to support an arm of a clip.

2. A brick according to claim 1 in which there are two recesses at diagonally opposite corners of the head of the brick.

3. A brick according to claim 1 in which there are recesses across all four corners, one pair of diagonally opposite recesses being deeper than the other pair, to provide four ledges for the arms of the two clips.

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