Nov. 17, 1953 F. HÖNIG 2,659,325

SUSPENDED BRICK ROOF WITH FLEXIBLE SUSPENSION MEANS

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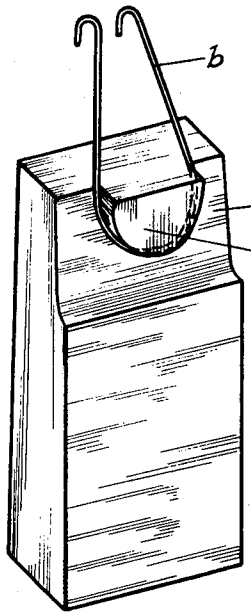


Fig. 1

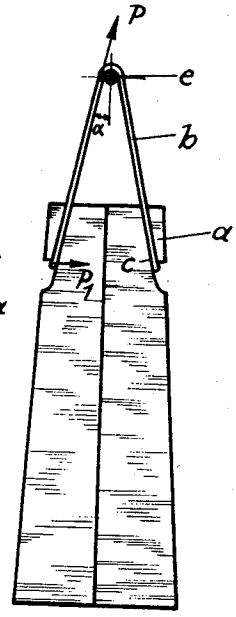


Fig. 2

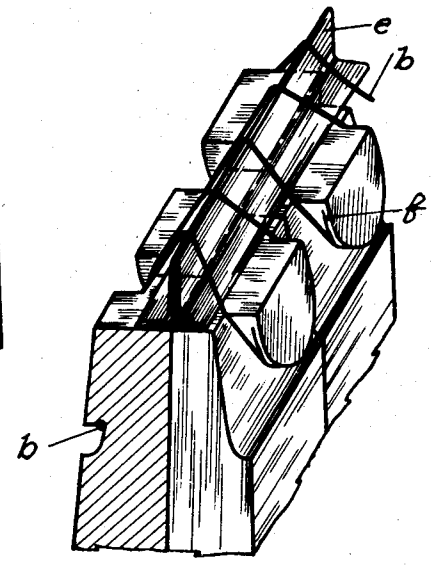


Fig. 4

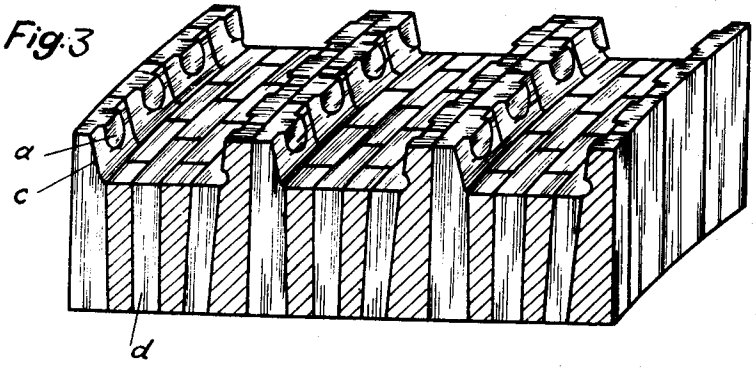


Fig. 3

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SUSPENDED BRICK ROOF WITH FLEXIBLE SUSPENSION MEANS

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2 Claims. (Cl. 110—99)

1

My invention relates to a special device of a brick suspension for suspended roofs of furnaces of the open-hearth type and the like, and more particularly to a suspension device for bricks which, as is well known per se, are provided on their upper part with a forwardly extending semicylindrically or similarly formed projection.

As to the prior art in this field, some types of brick suspension devices for suspended roofs of furnaces are known making use of rigid suspension members formed as toggle levers or the like, or in some cases as springy bails (see German Patent 512,702). With all devices of this kind, however, rigidity of the suspension members is assumed.

Objects of this invention are to lower the costs of such suspension arrangements, to simplify their construction, to avoid springy members in consideration of the temperature radiating from the furnace, and to attain a close laying-on on the adjacent parts of the bricks due to the yielding nature of the suspension device.

The suspension device according to this invention is formed of a flexible wire loop extending between the points of suspension in the direction of the tension. Advantageously the surfaces of the bricks adjacent the projections are slanted in conformity with the oblique position of the loops.

A suspension device according to the invention is simple with regard to the construction and to the assemblage and involves the possibility to form the loops for one or more pairs of bricks out of a continuous length of wire.

In the drawings an embodiment of the invention is shown by way of example.

Fig. 1 is a perspective view of a suspended brick and of a flexible loop suspending the same,

Fig. 2 shows a pair of bricks and the suspension in a side view,

Fig. 3 is a perspective view of a brick layer of a suspended roof according to the invention, and Fig. 4 is a perspective view of a modified brick assembly according to the invention.

Around the projection *a* of the brick, Fig. 1, the wire *b* of a diameter of about 2–5 mm. is wound; *c* designates the slanted surface of the brick around the projection *a*. The ends of the wire are bent over in a hook-like manner, to permit the brick to be suspended from a suitable support (not shown in Fig. 1).

As shown in Fig. 2, a pair of such bricks which may be laid joint over joint or in bond is suspended by a continuous length of wire looped around a beam or support *e*. The components P_1 of the tension in the loop press, as shown by

2

this figure, both bricks together, owing to the oblique position of the loop forming the angle *a* with the vertical contacting surfaces of said bricks. On the other hand a sliding movement of the wire off the projection is prevented by the action of said components P_1 pressing the wire under the projection towards the stone. In addition, of course, the projection may be provided with a downwardly extending nose or the like to secure the prevention of the sliding-off movement of the loop (see Fig. 4).

In Fig. 3 a suspended roof is shown built up with bricks of this kind laid in bond and forming the stringers of the arch and supporting intermediate rows of key-bricks *d*. These key bricks *d* may be made lower than the suspended bricks thus leaving a free space over them between the upper parts of the supporting bricks so that the suspension device is of easy access. It is an advantage of this feature that the loops can be easily attached and that the suspension device is not exposed to extreme high temperatures. Preferably the suspension bricks are arranged in rows between the abutments (Fig. 3 shows four rows of this kind) so that each row forms a supporting stringer for the bricks lying between said stringers. The brick surfaces *c* surrounding the projections *a* are slanted upwardly in correspondence with the direction of the tensile stress P so that the flexible loop can not get a sharp bend or break and is secured against a sliding-off movement.

The loops may be formed separately for each brick of a pair whereupon the two loops of a brick pair may be gathered up above and attached to the beam of the roof in a suitable manner. This suspension can be made, for instance, by means of a pair of hooks, each as shown in Fig. 1, the free end of each hook being hooked on the beam. Otherwise, as shown in Fig. 2, a double loop may be used for both bricks of a pair, or a series of loops common to some or all pairs of a row may be formed out of a single piece of wire. The latter modification is shown in Fig. 4 wherein a single wire *b* engages all the projections *a* of a double row of bricks, at the same time overlying a support *e* in the general manner illustrated in Fig. 2. Each projection *a* is furthermore provided with a nose *f*, as previously referred to, in order to prevent more assuredly a sliding off of the wire. It will be noted that the bricks are staggered, the same as in Fig. 3.

As compared with known types of suspension devices using rigid suspension members in the form of toggle levers or springy bails or the like

the suspension arrangement according to this invention using a flexible wire lowers the costs of the construction and simplifies the assemblage, especially when the successive loops are formed out of a continuous length of wire. This wire is relatively inelastic or supple, i. e. its springiness is low enough to let the wire lie snugly against the projections as shown; as a result the wire will be in contact with a substantial portion of each projection even in the case of relative displacement (e. g. during warmup of the furnace) between the bricks and the supporting member. With the loops lying close to the roots of the projections there are practically no stresses in bending the projections but merely shearing stresses, a feature of importance especially for the use of bricks made of delicate materials such as chrome-magnesite. In cases of accidental rises of dangerous stresses the wire loop would tear and the projection of the brick would not be sheared since in constructing a suspension device according to this invention the dimensions of the suspension means may be decreased down to the lower limit of the tensile strength (for saving of material) because it is the aim of the invention to avoid a rigidity of the suspension means. Owing to its flexibility the loop lies close to the brick around the whole surrounded part of the projection and not, as it is the case in using rigid suspension members, on single points. In using a suspension device according to this invention the bricks may be easily laid in bond. The suspension by means of flexible loops permits a certain mobility in the longitudinal direction of the stringers in accommodation to the various expansion stresses evoked by the heat.

What I claim is:

1. In a suspended roof, in combination, a stringer comprising two rows of bricks placed back-to-back, each brick having at its front side a forwardly extending projection, a supporting member extending above and substantially parallel to said stringer, and flexible suspension means anchoring said bricks to said supporting member, said suspension means comprising a single wire wrapped back and forth successively over and in contact with said supporting member and alternately around and engaging the underside of oppositely extending ones of at least a plurality of said projections.

2. The combination according to claim 1 wherein the bricks of one row are staggered relative to those of the other.

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