June 25, 1929. L. M. WALSH 1,718,671

COMBUSTION ARCH HANGER

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Fig. 1.

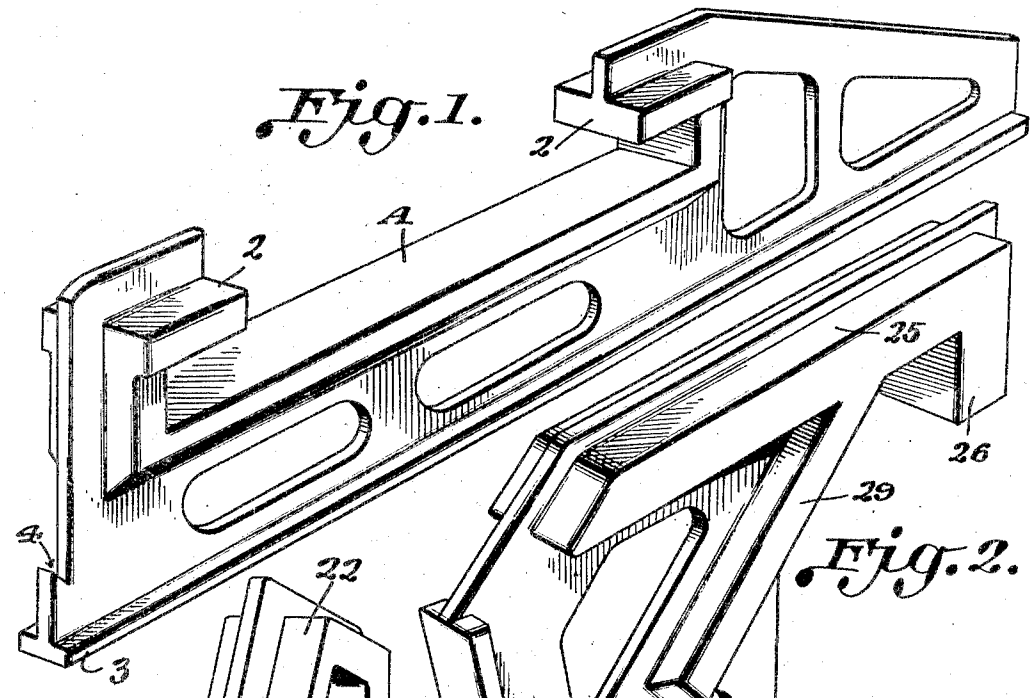

Fig. 2.

Fig. 3.

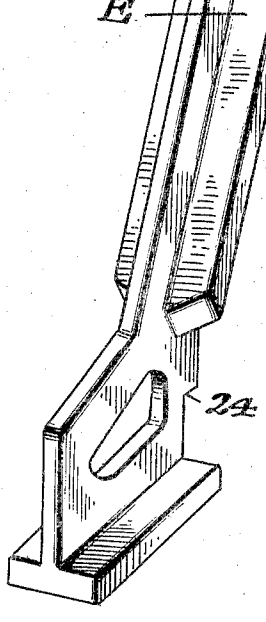

Fig. 4.

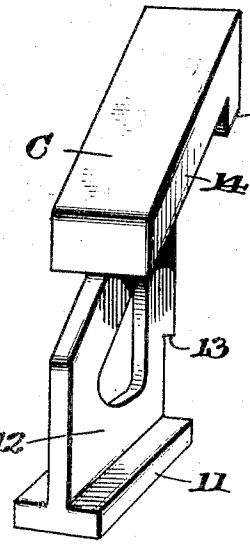

Fig. 5.

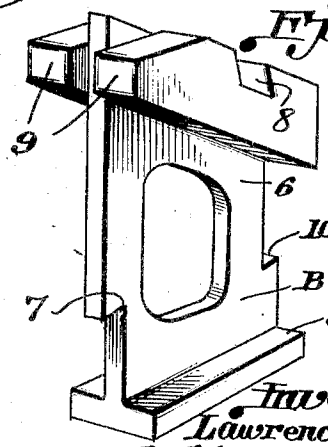

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Fig. 6.

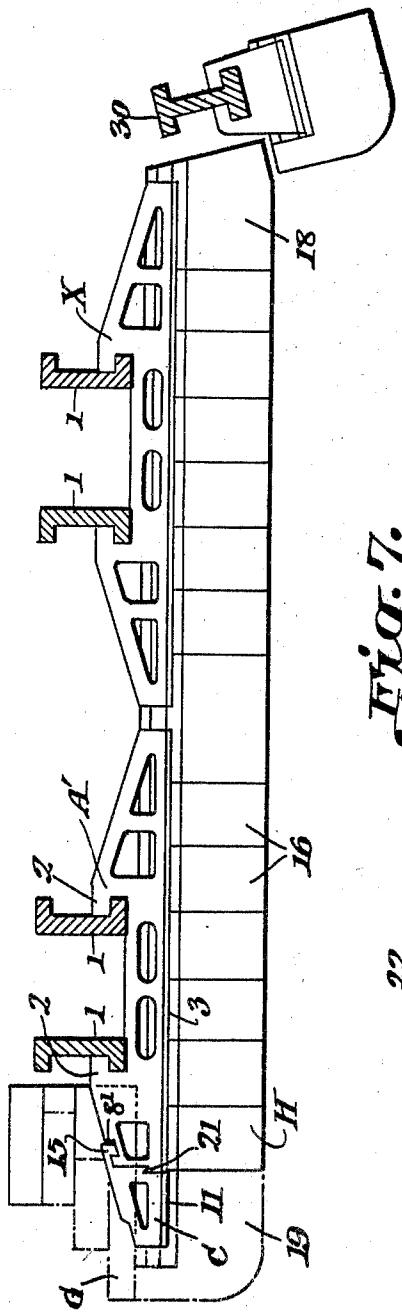
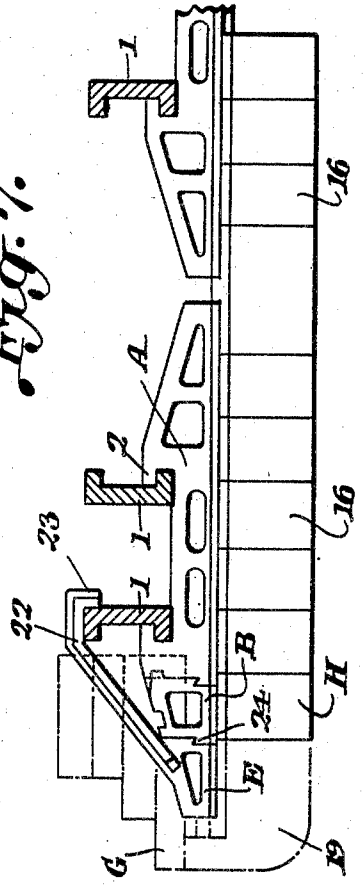


Fig. 7.



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COMBUSTION ARCH HANGER

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Fig. 9.

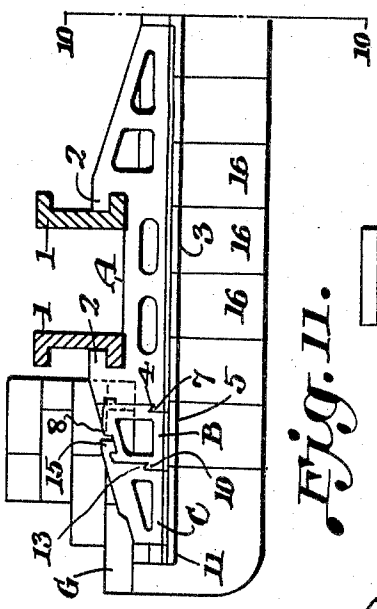


Fig. 11.

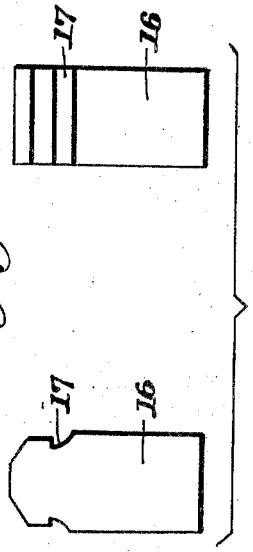


Fig. 13.

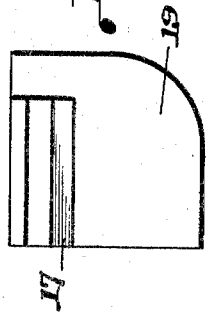


Fig. 8.

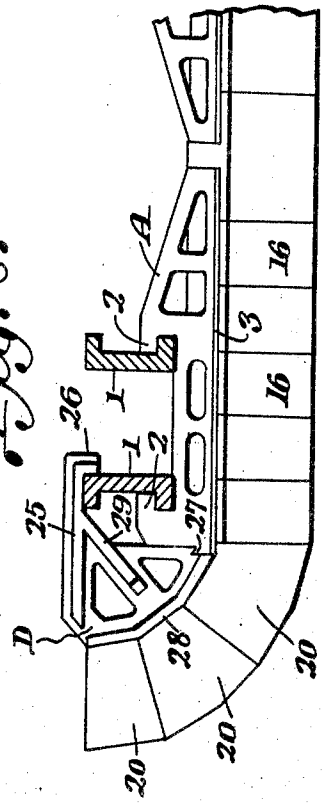


Fig. 10.

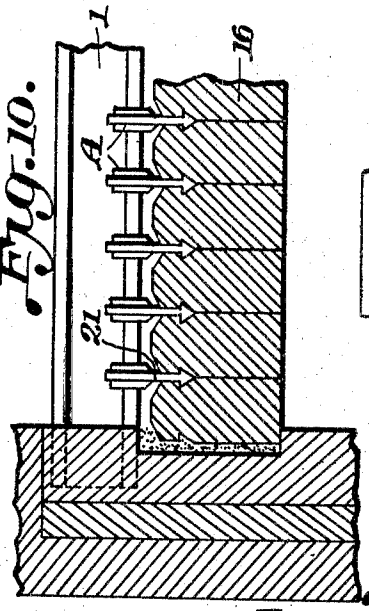
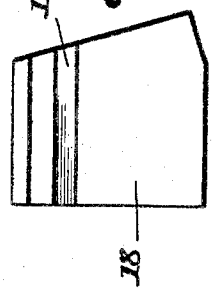


Fig. 12.



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UNITED STATES PATENT OFFICE.

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COMBUSTION-ARCH HANGER.

Application filed October 29, 1925. Serial No. 65,620.

Furnace arches of the type known as suspended arches have many distinct advantages and are quite generally employed in certain types of furnaces. Arches as at present built have an average life of about nine months. This is because the end fire brick blocks or tiles strip off and crack, thereby letting the heat and fire up to the end of the supporting iron, which causes it to swell, char and break off. It is thereupon necessary to either shorten the arch some six inches or to renew the arch. If the arch is shortened, the combustion is interfered with to a certain extent since the baffles and drafts are set for an arch of certain specified measurements so far as length and height are concerned. Moreover, it is sometimes impossible to shorten the arch because the irons are burnt off to a too great extent. To replace the arch is, of course, expensive and throws the furnace out of operation through an appreciable period of time.

My invention relates to a specific form of hanger support for such suspended combustion arches wherein it is possible to renew the end of the hanger if it becomes damaged by the heat so that repairs can be made quickly and at slight expense. The life of the arch is thereby increased to from eighteen to thirty months, since its life is limited by the duration of the central or main blocks of the arch.

The invention may be embodied in various specific forms but consists broadly in making the arch hangers of two or more pieces, the smaller portions being at one extreme end thereof so that by merely removing one or two of the end tiles the damaged portion of the arch hanger may be removed and a new portion supplied. The time necessary for the change is relatively short and the expense is not great. Moreover, the provision of the separate and detachable portions at the end of the arch hanger enables arch hangers of different types to be formed by the use of differently shaped end pieces combined with a standard body portion.

In the drawings:

Figure 1 is a perspective view of the main portion of the improved arch hanger.

Figures 2, 3, 4, and 5 are similar perspective views of the other portions which may be combined with the structure shown in Figure 1 in various ways as hereinafter set forth.

Figure 6 is a sectional view showing the general type of suspended arch together with one arch hanger of the common construction and another embodying the present invention.

Figure 7 is a similar view showing the general form of arch hanger.

Figure 8 is a similar view showing a further modification of the end piece.

Figure 9 is a similar view showing a still further modification resembling that of Figure 6 except that two detachable pieces are provided instead of one.

Figure 10 is a section on the line 10—10 of Figure 9.

Figure 11 shows face and edge views of the central tiles or fire bricks.

Figures 12 and 13 show edge views of different forms of tiles which may be employed at the ends of the arch.

Referring first to Figure 9, the usual channel irons 1 supported by the side walls are illustrated in section. In this figure is shown an embodiment of the present invention consisting of an arch hanger having a main member A and two detachable members B and C. This member A is provided with lugs 2 which overlie the lower flanges of the channel irons 1 and rest thereon. The body of this member A is generally I-shaped in cross section and the lower flange 3 extends the full length of the member. At one end is a notch 4 for a purpose hereinafter mentioned. The detachable member B as specifically shown in Figure 5 has a body portion 6 with a lower flange 5 similar to the flange 3 of the member A and forming a continuation thereof, an incut notch 7 facing oppositely to the notch 4 in the member A and interlocking therewith when the parts are assembled. The top of the member B has a groove 8 extending transversely thereof for a purpose hereinafter mentioned. The upper part of the member B has at one side two lugs 9 which are adapted to pass on either side of the central portion of the member A when the parts are assembled as shown in Figure 9.

The member C which is used in this embodiment is shown specifically in Figure 4 and comprises a body member 12 having a lower flange 11 constituting an extension of the flanges 3 and 5 and also has a notch 13 which interlocks with a reversely facing notch 10 on the member B when the parts are assembled. The top of the member C is extended and has a downwardly projecting lug 15 which fits in the groove 8 in the top of the member B.

The central tiles or fire bricks 16 have the general form shown in Figure 11 and have notches 18 at their edges while the end tiles may take the form 18 shown in Figure 12, the form 19 shown in Figure 13, or the form 20 shown in Figure 8. In any case, these tiles are supported by members 21 which engage the arch hangers in the usual manner.

The modified form shown in Figure 6 is similar to that of Figure 9 except that the parts A and B are made integral. The end of the part A′, therefore, has a groove 8′ into which the lug 15 of the member C fits, and there is the usual interlocking engagement at 21 between the two members. This figure also shows at the right hand side thereof an arch hanger X of the old form. With either of the forms described, if it is necessary to replace the end portions of the arch hangers when they burn out, it is only necessary to remove the first brick above the arch block or iron, as for example, the brick G shown in Figures 6 or 9. The rest of the curtain wall is left resting on the arch block indicated at H in these figures and a bond of the brick holds the rest of the wall in place. The damaged piece C in the Figure 6 form, or the damaged pieces B and C in the Figure 9 modification if both have been damaged, can then be readily removed and new members replaced without any difficulty whatever.

In the modified form shown in Figure 7, the members A and B remain unchanged, but a different form of end member E illustrated in Figure 3 is shown. This member has an upwardly extending portion 22 provided with a downturned end or lug 23 which hooks over the top of the channel iron 1, the downturned end 23 fitting inside of the same. There is the usual interlocking engagement at 24 with the member B. In this form the end member E is supported mainly by the channel iron and only partly by the member B.

The modification disclosed in Figure 8 is employed when it is desired to use arch blocks 20 which are preferable in many respects to the forms previously shown, since they only have one surface exposed to the fire and heat. In this modification, the member A is combined with the member D shown in Figure 2. The body member 25 has a downwardly extending end 26 which hooks over the top of the channel iron 1 exactly as does the end 23 of the member E illustrated in Figure 7. There is also an interlocking engagement of the same type at 27 with the member A. This member D is provided with a flange 28 and also with strengthening side portions 29. It is obvious that this portion of the arch and the member D can be removed whenever damaged without interfering with the remainder of the combustion arch.

It is to be understood that instead of the channel iron 1 illustrated in the drawings, these two irons may be united to form an I beam, such as indicated at 30 in Figure 6. The parts A may be cast with the desired space between the ends of the portions 2 so that they can fit an I beam if desired. In such a construction if these I beams sag or become bent, they can be turned over and again used.

The arch blocks or tiles 16, 18, and 19 are of common form and the arch blocks 20 differ only slightly therefrom and can be obtained without any substantial increase in the cost of the construction. It is obvious that the invention permits the ready and quick repair of damaged end portions of the arch hangers with but slight expense and little delay. The precise form of the detachable portion may be varied considerably without in any way departing from the spirit of the invention and other detail changes may be employed as desired so that the invention is to be regarded as limited only by the scope of the appended claims.

I claim as my invention:

1. A combustion arch hanger adapted to be suspended from the usual beams and to support arch blocks, said hanger comprising a plurality of portions, one of which is directly suspended from said beams and another of which is a detachable portion that engages and interlocks with both the end and top of the adjacent portion.

2. A combustion arch hanger adapted to be suspended from the usual beams and to support arch blocks and having a main portion directly suspended from said beams and a detachable end member, said detachable member being provided with an extension continuous to its upper edge adapted to engage and interlock with the said main portion.

3. A combustion arch hanger consisting of a main portion loosely suspended from the usual beams, and a plurality of interlocking detachable members attached to one end of said main member, one of said detachable members being supported by engagement with said main member and the other of said detachable members being supported by said other detachable members and also by said beams.

4. A combustion arch hanger comprising a main member suspended from the usual beams and a detachable end member, said detachable member having an extension continuous with its upper edge, the end thereof being formed with a downwardly projecting

portion for interlocking engagement with slots formed in the said main member.

5. In a combustion arch hanger, in combination with a supporting beam, said hanger comprising a plurality of portions, one of said portions being suspended from said beam, another of said portions having means detachably interlocking with the end of the adjacent portion, and the last mentioned portion having a rearwardly extending arm integral therewith and engaging said beam.

In testimony whereof, I have hereunto subscribed my name.

LAWRENCE M. WALSH.