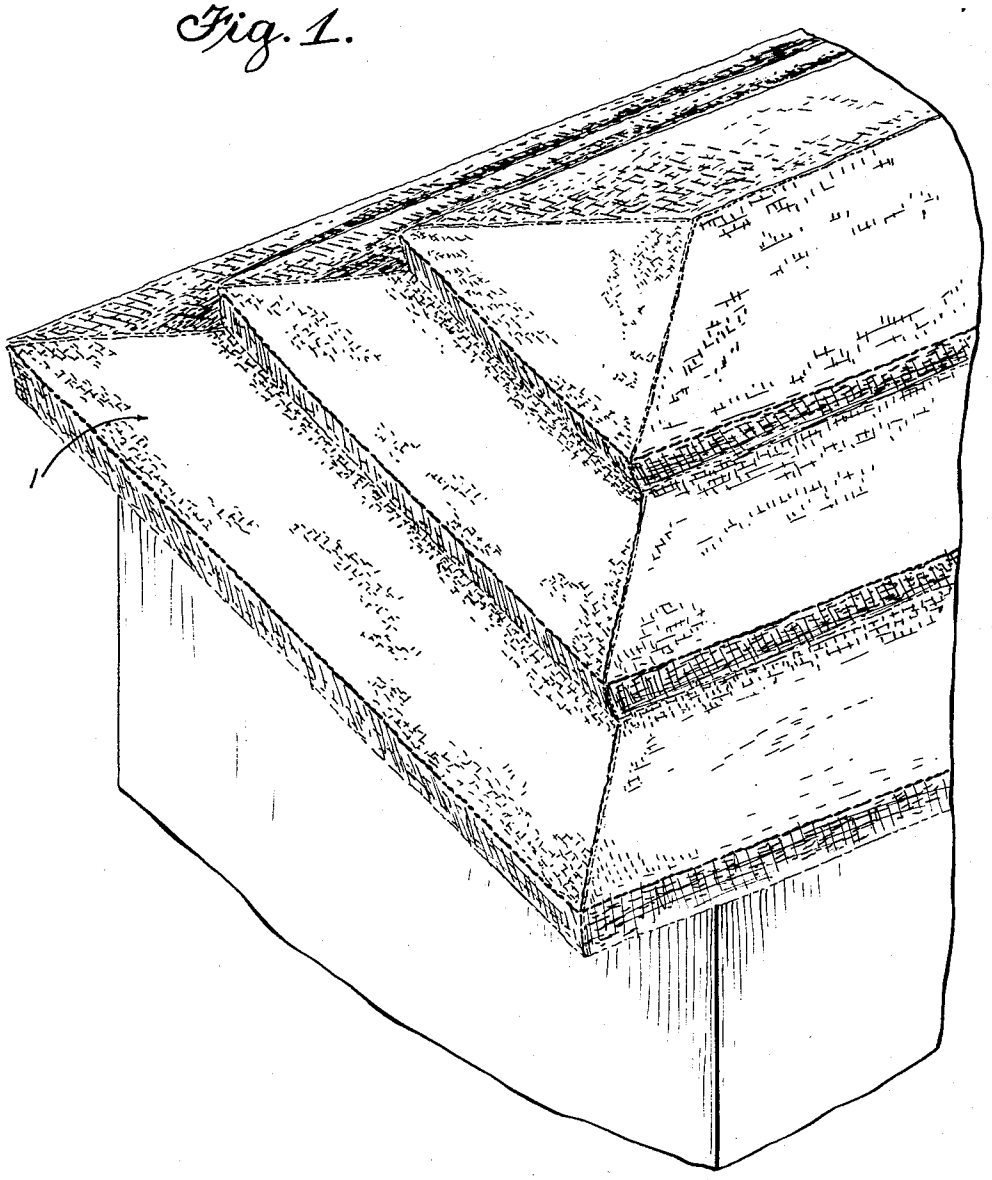
May 25, 1937. L. WRIGHT 2,081,191

ROOF AND WALL SURFACE

Filed March 23, 1936 2 Sheets-Sheet 1

Fig. 1.



INVENTOR.

Lloyd Wright

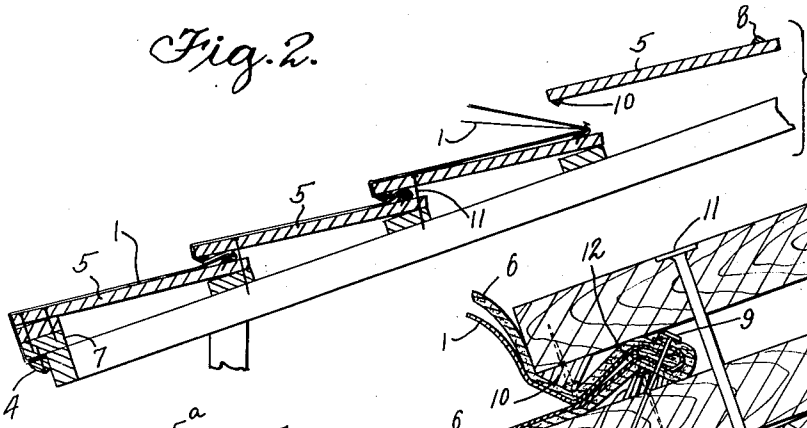
BY Lyon & Lyon ATTORNEYS

May 25, 1937. L. WRIGHT 2,081,191

ROOF AND WALL SURFACE

Filed March 23, 1936 2 Sheets-Sheet 2

Fig. 2.



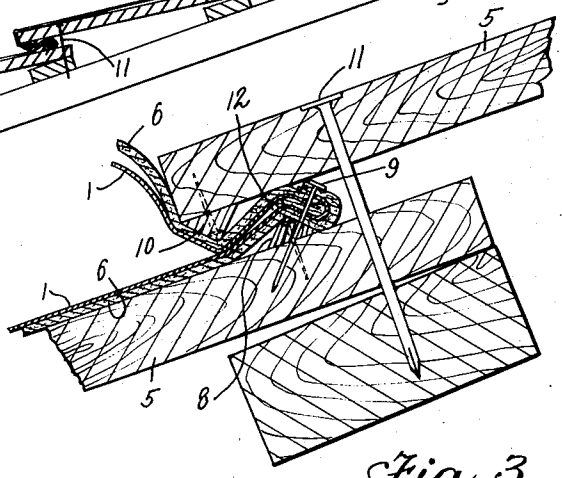


Fig. 3.

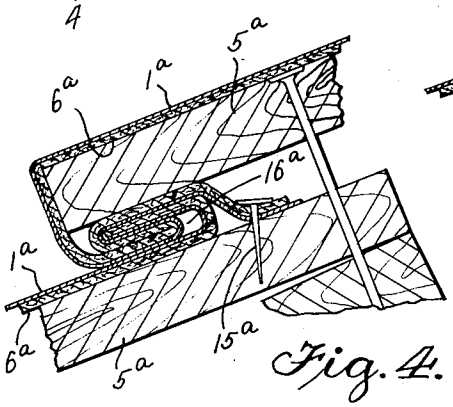
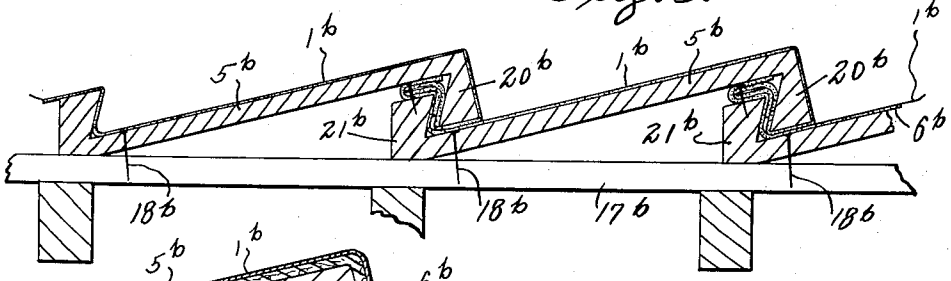


Fig. 4.

Fig. 5.



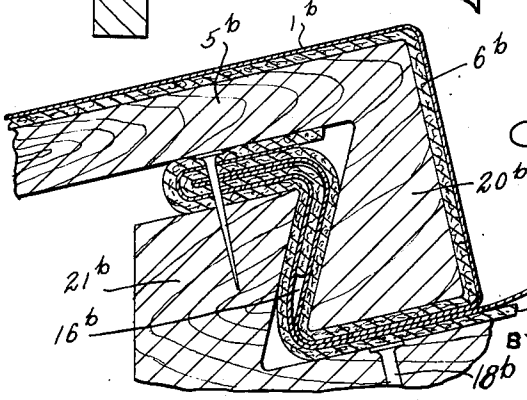


Fig. 6.

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Patented May 25, 1937 2,081,191

UNITED STATES PATENT OFFICE

2,081,191

ROOF AND WALL SURFACE

Lloyd Wright, Los Angeles, Calif.

Application March 23, 1936, Serial No. 70,449

12 Claims. (Cl. 108—13)

This invention relates to the surfacing of walls or roofs, and is more particularly directed to a roof surface. In considering any problem of roofing or wall construction, it is essential to approach the problem architecturally. By architecturally is meant from a standpoint of actual appearance and cost.

Heretofore sheet metals have been employed for covering walls and roofs where the sheets have been laid on roof decks or sheathing with seams or interlocking edges formed between the adjacent edges of the sheets. A roof covered in this way has little architectural value, both from the standpoint of utility and appearance in that difficulty has been encountered first in securing the sheet metal to the roof structure without the use of driving fastenings such as nails or the like which have seriously affected the utility of such roofs, and secondly, because the roofs as heretofore laid of sheet metal have had very little, if any, value from a standpoint of appearance. Furthermore, due to the methods of the application, and because of the weight of the material or metal used, such roofings have been costly.

My invention deals primarily with the architectural surfacing of a roof or wall wherein there is employed a thin metal sheeting so applied to the roof structure as to provide for utility, appearance, and enable the application to be made at a low cost.

An object of my invention is to provide a weather proof surface including interlocking core members which support and hold under tension on their surface thin sheets of metal or metal foil and form therewith a sealed and weather-tight surface.

Another object of my invention is to provide a simple and practical surface for walls or roofs, employing relatively thin metal sheets or metal foil, enabling the use of thin, wide and long sheets of metal or metal foil, wherein the metal sheet or metal foil is supported by interlocking core members, and by which core members the thin metal sheets or foil are connected in a weather-tight manner, and in a manner to permit of the required expansion or contraction incident to weather changes, and wherein the metal sheet or foil is maintained taut and flat upon the surface of the core members.

Another object of my invention is to provide a roof surface of thin, long and wide metal sheets or foil wherein provision is made for maintaining of the said material under tension without the piercing of the sheets or metal foil while still providing a sealed expansion joint between the adjacent sheets of material.

Another object of my invention is to provide a simple roof surface which will enable the formation of the water-tight and sealed joints between adjacent sheets of thin metal or foil, and which expansion joint is designed to prevent leakage through capillary attraction.

A further object of my invention is to provide a simple construction which will have architectural value in that it will produce a decorative roof surface susceptible to a variety of architectural designs and enabling the creation of suitable shadow pattern and texture effects.

A further object of my invention is to provide a surfacing using a thin metal sheet or foil wherein a compensating means is employed to protect the relatively thin metal sheet or foil from shearing strains or distortion.

Other objects and advantages of this invention it is believed will be apparent from the following detailed description of a preferred embodiment thereof as illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a perspective view of a roofing construction embodying my invention.

Figure 2 is a sectional view of a roofing construction embodying my invention, which section is taken through the roof near the eaves, wherein the upper portion of the roofing frame is broken away.

Figure 3 is a fragmentary sectional view upon an enlarged scale of the structure illustrated in Figure 2.

Figure 4 is a view similar to Figure 2 illustrating a modified form of my invention.

Figure 5 is a fragmentary sectional view illustrating a further embodiment of my invention.

Figure 6 is an enlarged fragmentary vertical section illustrating the structure of Figure 5 upon a larger scale.

I have found that in the construction of a roof from relatively thin sheets of metal or metal foil such, for example, as copper foil or thin copper sheets, that the material thus attempted to be used has considerable strength in tension but very little shearing strength. This foil or thin sheet metal is relatively flimsy and can be very readily distorted, enabling the material to be bent or formed by hand.

In carrying out the method of surfacing embodying my invention, it is preferable that the surface to be covered, for example, a roof frame, be laid from the eaves. The thin sheet of metal

or foil is fastened under the eaves by the use of a fastening member positioned upon the under surface of the eave and secured to the roof frame structure. The edge of the foil or thin sheet metal is secured in position under this fastening member. A continuous sheet of metal is then formed over the edge of the eave and a continuous supporting member or core is applied to the roof frame and the thin sheet of metal or foil is applied to the upper surface of the core member. Thus the first sheet of metal is laid from the eave and extended over a continuous support with its upper edge free. Under the first sheet of metal, as is true of each sheet of metal employed in making up the roof, I apply over the core member a sheet of material such, for example, as roofing felt, tar paper, or the like. The free edge of the sheet or foil of metal is then interlocked with the next, or adjacent, sheet of material and secured in position with a suitable securing member over an elevating member or core section in the interlocking end consisting of a convolution of the edges of the adjacent sheets of material and the felt, tar paper, or the like. As the sheet of material is thus secured in position, it extends free above the core member. The second sheet or foil of metal with its tar paper is laid out flat upon the first sheet of material. A second core member, having a tension member or core section at its under forward end, is then applied to the roof frame with the tension member bearing against the second sheet of roofing felt and thin metal or foil, pressing the same into engagement with the first sheet or foil of metal, and as the fastening members or nails secure the same to the roofing frame, the tension member of the second core forces the first sheet of metal and felt into contact with the first core member, thereby applying tension to the first sheet of metal, and likewise forming a joint between the two sheets or foils of metal which will resist the entrance of moisture to the joint between the two sheets or foils of metal. In this manner the whole roof may be laid with each sheet of metal under tension and with an expansion joint between the adjacent sheets of metal. The core members it will thus be seen are interlocked and maintain the sheets of metal supported and under tension, and at the same time provide a weather-tight expansion or contraction connection between adjacent sheets of metal.

As the roofing felt is enveloped between the sheets of metal, there is an air pocket provided to the rear of the joint provided under the tension blocks, which air space will defeat the effects of capillary attraction in attempting to draw moisture to the expansion joint.

The use of the padding sheet or roofing felt over which the metal foil or sheet is laid enables me, as the sheets are laid under tension, to lay the sheets of metal foil or thin metal, very smoothly, avoiding the effects produced by distortion of the foil or metal by slight projections appearing upon the cores. The roofing felt also prevents the puncturing of the metal foil by any projection present upon the core members, which may be made of any suitable material such as composition, plywood, insulating board, or the like.

In addition to this function of the roofing felt, the same performs a further and very important function in that it prevents electrolysis occurring between the metal members or nails by which the cores are secured in position and the copper of the thin sheet or foil.

In the particular illustration of my invention made in Figures 1, 2, and 3, the adjacent sheets of thin metal or foil may be formed, as illustrated in Figure 1, to give the metal foil or sheet the desired ornamental appearance or ornamental surface treatment, as may be required or desired to produce the particular ornamental or architectural effect sought, thus enabling the product of the desired or required shadow and light effect upon the roof when completed. Any suitable pattern may be produced upon the sheets 1 prior to their laying upon the roof.

The sheets 1 of material, as illustrated in the form of my invention in Figures 1, 2, and 3, are secured in position, starting from the eaves by means of the securing member 4 secured under the eave block 7, and extending over the first core member 5 over the roofing felt or tar paper 6. The securing member 8 is secured to the core 5 near its rearward edge and the adjacent edges of the two sheets of metal or foil 1 are then wrapped together with their sheets of roofing felt 6 preferably in the following manner:

In the upper of the sheets of foil the roofing felt is wrapped over the edge of the foil. The roofing felt of the first sheet is merely extended to the free edge of the foil. With the roofing felt sheet laid over each other, the free edge of the first sheet of foil and felt is bent over the free edge of the second sheet 1. The edges thus folded together are nailed at suitable intervals to the continuous member 8 by means of nails 9 spaced apart. The second core member 5 carrying on its front under edge a tension block 10, is then positioned with reference to the upper rafter and with the core member 10 pressing against the felt 6 of the second sheet of metal 1, and nails 11 are then passed at suitable intervals through the second core member 5 to clamp the tension member 10 in position and force the felt 6 and sheet 1 against the first core member. In this manner it will be observed from Figure 3 that an air pocket 12 is formed between the two sheets of metal 1 above the joint provided between these two sheets of metal immediately underlying the tension member 10. This type of sealing joint permits of the required expansion and contraction of the material under changes of weather condition and the use of the felt underneath the sheets of metal 1 avoids possibility of a shear of the sheets of metal 1 in passing over or around the different projections of the roof surface and around the edges of the cores.

In Figure 4 this embodiment of my invention is similar to that heretofore discussed with the exception that the expansion joint provided between the edges of the sheets of material is of a slightly different form. In this joint the lower sheet of metal 1^a is laid over the lower core member 5^a and in this form of joint the tension securing members are eliminated and the clamping effect provided by the nailing of the two core members or roof sheetings over the joints formed between the adjacent sheets of metal 1^a and felt 6^a is alone relied upon. In order to form a secure joint in this method the upper sheet 1^a of metal and its sheet of felt 6^a is bent upon itself before fitting into the space provided by bending the first sheet of metal 1^a and felt 6^a. The free end of the second sheet of metal 1^a and felt 6^a is then passed over the entire joint and secured in position by members or nails 15^a. Thus the exposed surface of the joint contacting

the two core members 5^a are roofing felt so that there is no direct contact of the core members or roof sheeting with the thin sheet metal or foil. The convoluted form of the joint thus formed permits of the required expansion or contraction of the material under the changing effects of temperature. In this type of joint it is preferable that the portion of the second sheet of material 1^a and felt 6^a which are bent upon themselves do not extend completely to the rear pocket form by bending the first sheet of material 1^a upon itself so that there is provided a free air space 16^a in the joint which permits of the free expansions and contractions of the material necessary and likewise provides an air space which will act to defeat the effects of capillary attraction.

The form of my invention illustrated in Figures 5 and 6 is substantially the same as that heretofore discussed so that similar numerals have been applied to similar parts with the addition of an exponent "b" thereto, the distinction being that the form of my invention illustrated in Figures 5 and 6 the core members 5^b are specially formed with overlapping and interlocking abutments of the cores 20^b and 21^b between which the sheets of material 1^b and roofing felt 6^b are clamped. The use of these special core members may be resorted to to obtain the desired lapping effect and the desired architectural appearance.

As in the previous cases discussed, the interwrapping of the adjacent edges of the foil or sheet metal 1^b and the roof felt is to permit of the provision of an air space 16^b to defeat the effects of capillary attraction and likewise the felt is so wrapped with relation to the bending of the adjacent sheets of thin metal or foil that the material actually in contact with the cores at all points is the roofing felt.

The downwardly projecting edge 20^b of the upper formed core member 5^b provides the tension member 10^b as in the first modification of my invention heretofore discussed, causing the material to be stretched under tension and likewise forcing the material to lie flat upon the upper surface of the lower continuous core member. It is obvious that these specially formed core members may take any desired form to produce the architectural and tension effect desired.

In the modified form of my invention illustrated in Figure 5, the core members 5^b are formed with core sections or projections 20^b and 21^b which are interlocking and which maintain the core members 5^b in position against any tendency of the same to raise vertically. The thin metal sheet or foil is positioned between these interlocking sections and the edges of the adjacent sheets and roofing felt are connected together between the projections 20^b and 21^b and the fastening or securing members 18^b by which the core members 5^b are held in place are preferably passed through the upper core member into the frame 17^b. The core members 5^b are thus held in position by securing the same to the frame of the wall or roof and are not secured directly together because of the projections 20^b and 21^b, and because of this manner of securing the cores 5^b in position, the sheet metal 1^b and the roofing felt 6^b are held taut in position, and because of the interfitting character of the projections 20^b and 21^b the core members 5^b can not move vertically. Because of the cantilever arm provided by the core members from the point of the securing members 18^b and the resiliency of the core members, this manner of securing the sheet metal 1^b to the roof compensates for the expansion or contraction of the sheet metal 1^b under changing weather conditions.

The roofing felt or similar material applied to the core members and upon which the thin metal sheets or foil 1^b are laid in addition to providing a means for protecting the thin metal sheets or foil 1^b, likewise provide a compensating element between the metal sheet or foil 1^b and the cores 5^b. The resiliency of the material used such as roofing felt or the like permits of the expansion or contraction of the sheet metal or foil and compensates for this expansion or contraction without permitting the sheet metal or foil 1^b to sag or become loose upon the surface. Expansion and contraction of the sheet metal or foil is also compensated for by the joint between the core members, and by the resiliency of the core members themselves. As the core members act to hold the sheets of metal or foil under tension and are secured in position at points removed from the point of contact with the sheet of metal, a cantilever arm is provided which is under strain in maintaining the sheets of metal or foil in tension. As the sheets of metal or foil expand or contract the resiliency of the core members under strain compensates for this change and still maintains the sheets of metal or foil taut and in contact with the core members.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details herein set forth, but my invention is of the full scope of the appended claims.

I claim:

1. A weather-proof surface including interlocking core members, thin sheets of metal supported on the surface of the core members, means interlocking the core members, and the interlocking of the core members acting to maintain the sheets of metal taut, and to form between the sheets of metal a sealed weather-tight connection.

2. A surface including interlocking core members having spaced tension portions, relatively thin sheet metal or foil applied to the core members between the adjacent portions of the core members, and means for securing the core members in position.

3. A surface including interlocking core members having spaced projections at their adjacent edges, relatively thin sheet metal or foil applied to the core members and having their adjacent edges connected together, the edges of said sheets of metal being positioned between the core member projections, and means for securing the core members in position.

4. A surface, including interlocking core members, roofing felt applied over the core members, relatively thin sheet metal or foil applied to the core members over the roofing felt, the adjacent edges of the relatively thin sheet metal or foil and the roofing felt being connected together, and means for securing the core members in position.

5. A surface, including interlocking core members having spaced tension portions, roofing felt applied to the core members over the upper surface theerof, relatively thin sheet metal or foil applied to the cores over the roofing belt between the adjacent tension portions of the core mem-

bers, and means for securing the core members in position.

6. A surface, including interlocking core members having spaced projections at their adjacent edges, roofing felt applied to the core members, relatively thin sheet metal or foil applied to the core members over the felt, and having their adjacent edges connected together, the edges of said sheets of metal or foil being positioned between the core member projections, and means for securing the core member in position.

7. In a surface construction, the combination of a supporting frame, a core member abutting the said supporting frame, a second core member overlapping the edge of the first-named core member on the side thereof remote from the supporting frame, a metal foil sheet lying flat upon the outer face of the first-named core member and extending under the adjacent edge of the last-named core member, a fastener extending through the overlapping portions of the said core members at a point spaced from the interlocking joint and where the said fastener secures the cores together without piercing either metal sheet, a metal foil sheet forming an interlocking joint with the first-named metal sheet in the space between said core members, said fastener operating to maintain the second-named core member pressed forcibly against the said joint, said second-named metal foil sheet extending out around the adjacent edge of the second-named core member lying flat upon the outer face of the same and covering the said fastener.

8. A weather-proof surface including interlocking core members, thin sheets of metal supported on the surface of the core members, means interlocking the core members, the interlocking core members including two spaced friction holds between which the thin sheets of metal are clamped, and acting to maintain the sheets of metal taut and to form between the sheets of metal a sealed weathertight joint.

9. A weather-proofing surface including core members, thin sheets of metal supported on the surface of the core members, interlocking projections formed at the adjacent ends of the core members between which interlocking projections the thin sheet of metal is clamped and held under tension to form a seal between adjacent sheets of metal, and means for independently securing the core members to a surface frame.

10. A weather-proof surface including interlocking core members, thin sheets of metal supported on the surface of the core members, the core members including complementary interlocking sections between which sections the free ends of the sheets of metal are clamped, the complementary core sections acting to maintain the thin sheets of metal under tension and upon the core surfaces.

11. A weather-proof surface including a frame, interlocking core members, thin sheets of metal supported upon the surface of the core members, the core members including interlocking sections, the ends of the sheets of metal being held between the interlocking sections under tension, and a fastening means for securing each core member to the frame, said fastening members being so positioned as not to pass through the thin metal sheets.

12. A weather-proof surface including a frame, interlocking core members, thin sheets of metal supported upon the surface of the core members, the core members including interlocking sections, the opposed ends of the sheets of metal being clamped between interlocking sections of the cores to hold the sheets under tension, and a fastening means for securing each core member to the frame.

LLOYD WRIGHT.